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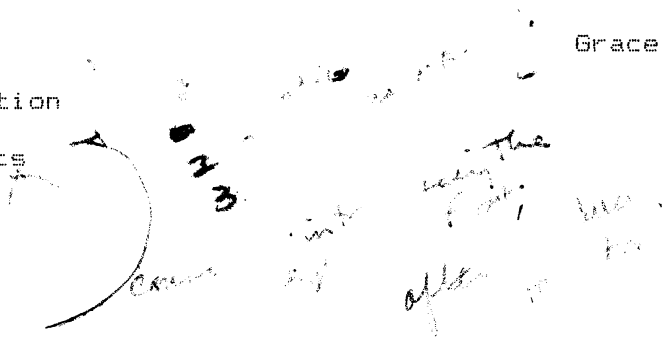
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Western Ixtl'an Zapotec Phonology

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1989

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0. ~~Introduction~~ *General Information* ?

Western Ixtl'an Zapotec is spoken in the mountain region approximately 30 miles north and slightly east of Oaxaca City in the district of Ixtl'an in the state of Oaxaca, Mexico. Western Ixtl'an Zapotec, henceforth WIZ, is spoken by approximately 7000 people, living in several communities in the area. Each community speaks a slightly different dialect of WIZ. The dialect described here is that of Santa Ana Yareni. <1>

#

1. Consonants

There are 25 consonantal phonemes in WIZ (excluding a few phonemes which occur due to borrowings from Spanish.) They

are:

OBSTRUENTS

| | labial | labial | inter- | alveo- | alveo- | retro |
|------------|--------|--------|--------|--------|---------|--------------|
| | labial | dental | dental | dental | palatal | flexed |
| | | | | | | alveo- velar |
| | | | | | | palatal |
| fortis: | p | | | t | | k |
| stops | | | | | | |
| lenis: | b | | | d | | g |
| fortis: | | | | c | *c | |
| affricates | | | | | | |
| lenis: | | | | | *j | |
| fortis: | | | -θ | s | *s | .*s |
| fricatives | | | | | | |
| lenis: | | | -ð | z | *z | .*z |

SONORANTS

| | | | | | | |
|----------|----------|--|--|----------|--|--|
| fortis: | <u>m</u> | | | <u>n</u> | | |
| nasals | | | | | | |
| lenis: | | | | n | | |
| fortis: | | | | <u>l</u> | | |
| laterals | | | | | | |
| lenis: | | | | l | | |
| fortis: | | | | <u>r</u> | | |
| vibrants | | | | | | |
| lenis: | | | | r | | |

The basic contrast in the consonant system is the fortis-lenis dichotomy. With the exception of the fortis affricate /c/ ,the fortis velar fricative /x/ and the fortis labial /m/, all consonants fall into fortis-lenis pairs. Length is the major means of distinguishing between fortis and lenis; a fortis consonant is always longer and has

consistently greater constriction than its lenis counterpart. Voicing is not a feature which conspicuously distinguishes fortis from lenis segments ^{in WIZ} although some lenis consonants are voiced.

1.1 Obstruents.

Fortis obstruents are voiceless except for the alveopalatal fricative which is voiced. Lenis obstruents vary with respect to the degree of voicing they exhibit.

by consonant? by type? by position in syllable?

The stops are at the labial, dental and velar points of articulation. The labial and velar fortis stops are distinguished from their lenis counterparts by voicing. Both fortis and lenis dental stops are voiceless and are distinguished by length.

The stops of WIZ are:

| | | | |
|---------|---|---|-------|
| fortis: | p | t | k |
| lenis: | b | d | g <?> |

/p/ 'pe²pi¹ (3) [p:²&p:i] <fire fan> 'u¹pa³ ['up:¹?] <light drizzle>

/b/ 'be²bi³ ['-be:-bi] <fertilizer> 'ru¹ba² ['*ru:-b¹] <small reed basket>

du²'ba³ [tu' -ba: ?] <spider web>

/t/ 'ti²pa² [t:ip:] <callous> 'be²ti² [-b&t:i] <epazote>
 ru²'te³na² [*ru'te:na] <He is burning.>

/d/ 'di²pa¹ [tip:] 'be²³di² [-be:ti] <blood
 sucking bat>
 ru²'de³na² [*ru'te:na] <He is giving.>

/k/ 'ku²lu¹ [k:ul:u] <tamal> 'la²ka² [l:ak:] <soap
 plant>
 be²'ke²-Oa¹ [-be'k&-O^] <hawk>

/g/ 'gu²² [-gu:] <potato> 'la²ga² [l:a-g^] <leaf>
 ra²'ge³-di¹ [ra'-ge:-di] <weasel>

The lenis dental stop when following another consonant
 in the same morpheme has a lengthened allophone, ^{slightly} ~~this~~ ^{which is}
~~allophone is longer than the lenis dental stop but~~ shorter
 than its fortis counterpart. ^{a. fortis dental stop}

'dundu [tuntu] <naked>
 i.*z danda [i.*s'tant^] <billowing>

In this same environment across morpheme boundaries the
 lenis dental stop becomes fortis when the syllable in which
 it occurs is stressed. ^{prev. this}

bin'to [-bin'to:] <child> ^{also, prev. this alternates with a lenis stop}
 '*zeta'.*ztila [*z&t:^'.*st:i:l^] <bread>

The lenis stops /b/ and /g/ are voiced, as has already been

mentioned, and frequently involve incomplete closure. The lenis velar stop fluctuates to fricative in any environment but particularly preceding high vowels. In the speech of some speakers a word-initial lenis velar stop is sometimes lost preceding a high back vowel in an unstressed syllable. For example:

gu²'*zie²¹ /gu²*zie/ / u'*zie/ <a type of plant>

The velar consonants both have fronted allophones preceding front vowels. For example:

'gi¹² [-gi:] <light, fire>
'ke¹²-da³ ['ke:-d[^]?] <mottled grey>

The phoneme /g/ has a backed allophone preceding and following a low central vowel. For example:

*za²ga² ['*za:-g[^]] <tree, wood>

The lenis stop /g/ also has a rounded allophone following a back rounded vowel and preceding a high front vowel. A labialized off-glide is sometimes articulated. For example:

*zio²gi² ['*zio-gi?] ['*ziogwi?] <ground in dirt>

The affricates are at the alveolar and alveopalatal points of articulation. All affricates are voiceless. As stated above, the alveolar affricate does not have a lenis counterpart. The alveopalatal fortis and lenis affricates are distinguished by length and do not contrast word initially; only lenis

occurs in this position. ⁽⁴⁾ The affricates of WIZ are:

| | | |
|---------|---|----|
| fortis: | c | *c |
| lenis: | - | *j |

Examples:

/c/ 'ca²ba² [c'a:-b^h?] <woven reed belt> '.*zi¹ci² ['.*sic:i] <elbow>

ku²'ci²ta² [ku'c:i:t^h] <grasshopper>

/*c/ '*can²ku² [c'a,nku] <female turkey> '.*zi²*cu² ['.*si*c: u] <onion>

ku²'*ciu² [ku'*c:iu] <tree trunk>

/*j/

 'pi¹*ju² [pi:*cu] <pigeon> (Spn.loan)

The fricatives are at the interdental, alveolar, alveopalatal, retroflexed alveopalatal and velar points of articulation. All fricatives are voiceless except for the lenis interdental and the fortis and lenis alveopalatal, which are voiced. Length serves to distinguish the fortis alveolar fricative ⁽⁵⁾ and the fortis alveopalatal ⁽⁶⁾ and retroflexed alveopalatal fricatives from their lenis counterparts. The alveopalatal fricatives do not contrast word initially only; lenis occurs in this position.

The fortis velar fricative does not have a corresponding lenis counterpart. The fricatives of WIZ are:

| | | | | | |
|---------|----|---|----|-----|---|
| fortis: | -θ | s | *s | .*s | x |
| lenis: | -ð | z | *z | .*z | - |

/-θ/ ' -θaʔ¹² [-θ:aʔa] <wedding> ' *za²-θaʔ [-*za-θ:ʔ] <canal>
 be²'-θu² [-be'-θ: u:] <adobe>

/-ð/ ' -ðaʔ¹² [-ðaʔa] <corn on the cob> ' *za²-ðaʔ [-*za:-ðʔ] <corn leaf>
 be²'-ðu²di² [-be'-ðu:ti] <cloth bag>

/s/ 'se¹ra² ['s:e:*rʔ] 'wax' (Spn. loan) 'i²sa³'do²³ ['is:ʔ'to:] <sweet corn>
 re²'so¹na² ['re's:ɔnʔ] <message>

/z/ 'ze¹la² ['se:lʔ] <mixture> 'di²³za³ ['ti*sʔʔ] <word>
 be²'zu²li¹ [-be'su:li] <grape>

/*s/ ----- 'roʔ¹² 'za²*sa² ['*za*z:ʔ] <one who talks alot>

/*z/ '*zie²la² [*zielʔ] 'roʔ¹² '*za²*za³ ['*za:*zʔ] <corn field> <closed mouth>
 ku²'*zu²*ci² [ku'*zu:c:iʔ] <grey>

*no
 cryptic
 info.*

*too
 tenous
 Gorfy Gorfy
 then course
 problems
 all over*

/.s/ '.*si²³la³ ['.*s:i:l[^]?] <wings> 'be¹.*su³ [-b&.*s: u] <cry
baby>

be²'.*su²nu¹ [-be'.*s: u:nu] <braid>

/.z/ '.*zi²³la¹ ['.*si:l[^]] <cotton> 'be².*zu¹ [-be:.*su] <dove>

be²'.*zu²ra³ [-be'.*su:*r[^]?] <charcoal>

/x/ 'xi¹²na² ['x:i?in[^]] <trunk> 'ru¹xa²lu² ['rux:[^]lu?] <you
are carrying>

The velar fricative has a backed allophone preceding a stressed low mid vowel. For example:

'xa²³ ['',xa?] <nine>

The lenis alveopalatal fricative /*z/ has a lengthened allophone when it occurs after interrupted vowels. The allophone is longer than the lenis alveopalatal fricative but shorter than its fortis counterpart.

'i¹²*za² ['xi?i*^z[^]] <breadfruit>

'-du²³*za¹ ['-du?u*^z[^]] <flower of the coffee bean>

As stated above, there is no fortis counterpart to the fortis velar fricative. Preceding a stressed high front vowel /x/ has very little length and is very lightly articulated. For example:

'xi¹²*za³ ['xi?i*^z[^]?] <mountain>

The velar fricative is optionally lost in an unstressed

syllable word initially. For example:

xa²'ba¹na² /xa'-ba:n^/ / a'-ba:n^/ <serape>

1.2 Sonorants.

The sonorant consonants are all voiced, ~~except for an~~ ^{aspirate} ~~that~~ ^{allophone} of the lenis vibrant. Fortis and lenis sonorants are distinguished by length, with the fortis sonorants being prolonged. The vibrants contrast only in word initial position.

The nasals are at the labial and alveolar points of articulation. The fortis labial nasal does not have a corresponding lenis counterpart

The nasals are:

| | | |
|---------|----------|----------|
| fortis: | <u>m</u> | <u>n</u> |
| lenis: | - | n |

Examples:

/m/ 'me¹e¹ [me.e] (?) <swing> 'zu²mi¹ [sum:i] <large reed basket>

/n/ 'ne¹la² [n:el^] <quickly> 'bi²ni¹ [-bin:i] <bird>

ru²'ni¹ti²lu²(e) [*ru'n:it:i"lu] <you are causing to make a mistake>

/n/ 'ne²ri³ [ne:*ri?] <sap> 'bi¹ni² [-bi:ni] <rubber band>

ri²'ni¹ti²+lu² [*ri'nit:i"lu]
 <you are making a mistake>

The labial nasal has a weak articulation in stressed word initial syllable. For example:

'me¹e¹ ['me.e] <swing>

There are very few examples of words containing /m/. Most of them seem to be of Spanish origin.

The alveolar lenis nasal has a velar allophone preceding a velar consonant within a word. When preceded by a low mid vowel the velar allophone also occurs in word final position or before another morpheme. For example:

'*jan²ku² ['*ca,nku] <female turkey>
 .*zu²'ban²+ka²+na² [.*su'--ba,nkan^] <their tail>

Following an interrupted vowel the alveolar nasal in the same morpheme is ~~always fortis~~. *lengthened. It is longer than the lenis alveolar nasal but shorter than the fortis alveolar nasal*

'ku²na¹ ['ku?un:^] <bull>
 ?
 'xi¹na² ['xi?in:^] <wooden box>
 ?

The lateral consonants are at the alveolar point of articulation.

The laterals are: ,

fortis: l
 lenis: l

Examples:

/l/ 'la¹ci² ['l:aci:] <gum> 'be¹la² ['-b&l:ˆ] <fish>
 e²'lo² [e'l:ɔ:] <food>

/l/ 'la²ci³ ['lac:iʔ] <flat> 'be²la¹ ['-be:lˆ] <meat>
 be²'lo³ [-be'lo:] <butterfly>

The vibrant consonants are at the alveolar point of articulation. The fortis vibrant is realized as a voiced trill and the lenis vibrant is realized as a voiced flap. Contrast between the fortis and lenis vibrant does not exist word medially in words of WIZ origin in that the /r/ does not occur in this position. However, fortis vibrants occur both word initially and word medially in Spanish loans. The vibrant consonants in WIZ are:

fortis: r̄
 lenis: r

Examples:

/r̄/ 'ran²*cu¹ ['ˆra,n*c:u] <round> 'bu¹ru² [~~'-buˆru]~~ <burro>
 (Sp.loan)

/r/ 'ran²ku¹ ['*ra,nku] <fat> 'la¹ri² ['la:*ri] <cloth>
 be²'re³ [-be'*re:] <ant>

In the speech of some speakers the lenis vibrant has a voiceless counterpart preceding an alveolar fricative. For example:

ir²'ze¹² [iR'se:] <supper>

Following an alveolar nasal across a morpheme boundary the lenis vibrant is phonetically realized as a trill preceded by a transitional voiced alveolar stop. For example:

'.*zi²n+'ri?¹² ['.*sin'-d~ri?i] <our (incl) nose>

2. Vowels

There are five oral vowels: / i e a o u / and their interrupted counterparts: / i? e? a? o? u? / (which are described in section 2.2). They are:

| | Front | Central | Back |
|-------|-------|---------|------|
| High: | i/i? | | u/u? |
| Mid: | e/e? | | o/o? |
| Low: | | a/a? | |

The vowels are shown to contrast in the following words:

| | | |
|-------------------------------------|------------|----------------------------|
| 'zi ¹ la ² | ['si:l^] | <flat earthenware griddle> |
| 'ze ¹ la ² | ['se:l^] | <mixture> |
| 'za ¹² | ['sa:] | <day> |
| 'zo ² la ² | ['so:l^] | <messenger> |
| '.*zu ¹² la ² | ['.*su:l^] | <shade> |

/i/ is high close front unrounded.

| | | |
|--|--------------|---------|
| 'i ² -d ² a ² | ['i:-d^] | <year> |
| 'gi ¹² | ['-gi:] | <light> |
| '*zi? ² *zu ¹ | ['*zi?i*zul] | <lime> |

| | | |
|-------------|----------------|----------|
| '*ji²ru¹ | ['*ci:*ru] | <bubble> |
| bi²'-da²bi¹ | [-bi'-'da:-bi] | <orphan> |

/e/ is typically mid close front unrounded. However, it has an open allophone /ɛ/ occurring in stressed syllables preceding a fortis consonant. There is only one example of /e/ occurring in unstressed syllable word-finally.

| | | |
|-----------|-------------|-------------|
| e¹'le²zi² | [e'l:e:si] | <corn hair> |
| 'be² | ['-be] | <wind> |
| 're²?¹² | ['*re?e] | <jug> |
| 'ze²ni¹ | ['se:ni] | <smoke> |
| *ze²'ba³² | ['*ze'-ba:] | <sky> |
| *ze²ta² | ['*z&t:ʔ] | <tortilla> |
| 'be²la³ | ['b&el:ʔ] | <snake> |
| 'be²ne¹ | ['-b&n:e] | <people> |

/e/ is further limited in distribution in that it cannot occur as the only vowel following /z/ and preceding lenis consonant.

is not phonetic

| | |
|-----------|--------------|
| *zie²-da² | <dried corn> |
| *zie²³ru³ | <hole> |

In unstressed syllables [e] fluctuates with [ɛ] preceding a fortis consonant. Preceding a consonant cluster [e] fluctuates with [ɛ] in both stressed and unstressed syllables.

| | | | |
|-------------|-----------------|----------------|-------------|
| be²'*cu³ra² | [-be'*c:u:*rʔ?] | [-b&'*c:u*rʔ?] | <fruit pit> |
|-------------|-----------------|----------------|-------------|

| | | | |
|---|-----------------|-----------------|-----------------|
| e ¹ 'le ² zi ² | [e'li:esi] | [&'li:esi] | <corn hair> |
| ku ² 'den ² zi ² | [ku'tensi] | [ku't&ensi] | <bag> |
| be.*s ² 'ku ² ni ¹ | [-be.*s'ku?uni] | [-b&.*s'ku?uni] | <soft tortilla> |

/a/ is typically low open central unrounded. It has a mid open central unrounded allophone [ʌ] which occurs word-finally in unstressed syllables. When /a/ is the second vowel of a vowel cluster in stressed syllable word-final position, it also is manifested as [ʌ]. For example:

| | | |
|--|--------------|----------------|
| 'a ² cu ² | [ʼac:u] | <weevil> |
| zi ² 'da ¹ | [si'ta:] | <14> |
| be ² 'la ² ni ¹ | [-be'li:a?a] | <ravine> |
| u ² 'da ¹ ma ² | [u'tam:ʌ] | <owl> |
| 'ba ² da ² | [ʼ-ba:tʌ] | <wide> |
| 'dua ² | [ʼtuʌ] | <agave cactus> |
| 'bea ¹ | [ʼ-beʌ] | <cloud> |

/a/ also has a low close front unrounded allophone [e] which occurs in the interrupted vowel cluster /e?a/. When /e/ precedes /a/ across a morpheme boundary, /a/ is realized phonetically as [e]. For example:

| | | |
|--|-----------|-----------|
| u ² 'be ² a ² | [uʼ-be?e] | <broom> |
| 'kue ² + a ² | [ʼkwe?e?] | <my back> |

When /e/ is not interrupted then the [e] occurs as a transitional vowel between the /e/ and the /a/. For example:

| | | |
|---|-------------------------|-------------|
| '.*zue ² + a ¹ | [ʼ.*sue ^e ʌ] | <my dinner> |
| ir ² 'ze ² + a ¹ | [i*R'se ^e ʌ] | <my supper> |

're²+a²pi¹ ['r^e@p:i] <raise again>

/o/ is a mid close back rounded vowel. Its distribution is much more limited than that of the other WIZ vowels. /o/ does not occur word-initially and it is not found word-finally in unstressed syllables. In all other positions in the syllable it occurs much less frequently than the other vowels. For example:

'lo¹ ['lo:] <face>
 '*zo¹ ['*zo'o] <house>
 'bo³-0i¹ ['-bo-0:i] <clay ball used in weaving>
 be²'lo³ [-be'lo:] <butterfly>
 .*zo³'li²zi² [.*so'li:si] <daughter-in-law>

/u/ is high close back rounded. For example:

'u²la³ ['ul:ʔ] <night>
 'du³ ['tuʔ] <rope, thread>
 be²'-du³ni² [-be'-'duʔuni] <fawn>
 '*cu¹ba² ['*cu:-bʔ] <net bag>
 be²'-0u² [-be'-'0:u] <adobe>
 ku²'nu¹ni³ [ku'nun:i] <frog>
 'bo²ku³ ['-bok:uʔ] <gnat>

The phonemes /o/ and /u/ fluctuate in a few words in unstressed syllables when the syllable is filled by a vowel. For example:

o²'.*ze¹a¹ u²'.*ze¹a¹ <tomorrow>

/o/ and /u/ contrast in the following examples.

| | | |
|--------------|--------------|-------------------|
| .*zi²'-0o²¹ | [.*si'-0:o:] | <grandchild> |
| be²'-0u² | [-be'-0:u:] | <adobe> |
| '*zo¹.*za² | ['*zo:.*s^] | <needle> |
| '*zu¹².*zi² | ['*zu:.*si] | <sand> |
| .*zo³'li²zi² | [.*so'li:si] | <daughter-in-law> |
| .*zu¹'la²li² | [.*su'la:li] | <plot of ground> |

Yuži!

When /u/ is the first vowel of a vowel cluster, it is realized phonetically as labialization of a preceding velar consonant in an unstressed syllable and in a stressed syllable preceding a fortis consonant. In a stressed syllable followed by a lenis consonant and in a stressed open syllable, /u/ is not realized as labialization of the preceding velar consonant but retains its vocalic quality. '9' There is no contrast between */k^wV/ and /kuV/ nor between */g^wV/ and /guV/. The following examples show the different environments in which the velar consonants followed by /u/ occur:

STRESSED SYLLABLE PRECEDING FORTIS CONSONANT:

| | | |
|-----------|-------------------------|--------------------|
| 'gua²la¹ | ['-g ^w al:ˆ] | <a type of lizard> |
| 'kui¹ta² | ['k ^w it:ˆ] | <ribs> |
| 'gui¹²ni¹ | ['-g ^w in:i] | <a type of insect> |

UNSTRESSED SYLLABLE

que²'za³ [-gwe'sa:ʔ] <witch>

'baʔ²gua¹ [-baʔagw^] <mask>

*p. as you have kw and gw as phonemes
by (CV) in unstressed syllables!*

STRESSED SYLLABLE PRECEDING LENIS CONSONANT:

'gua²ga¹ [-'gua-g^] <'wood, tree>

i.*z²'kua¹²-di¹ [i.*s'kua-di] <nest>

'gui²ni¹ [-'guini] <'a type of bean>

STRESSED OPEN SYLLABLE:

'que² [-'queʔ] <a scratch>

'kua¹ [-'ku^] <dough>

Should I just omit this or reword it?

In stressed syllables followed by consonant clusters (which take on certain fortis characteristics,) /u/ fluctuates between labialization of the preceding velar and taking its full quality as a vowel. For example:

'guel¹da² [-'guel^t^] [-'g^w<sup>t^] <once in a while>

'guen¹-di² [-'guen-di] [-'g^w&n-di] <an imp> (Spn loan)

When preceding a fortis consonant /u/ as the first vowel of a vowel cluster is realized phonetically as labialization of stressed non-velar consonants also. Examples of this kind, however, are found only in words which originally were polymorphemic.

'*juetu [-'c^w&t:u] <shell>

'.*zue¹²ta² [-'.*s^w&t:u^] <tortilla cloth>

2.1 Vowels are phonetically lengthened in stressed syllables to about two moras of length when that syllable is open (ie. word-final and not followed by the syllable V) or when it is followed by a lenis consonant.

IN WORD-FINAL OPEN SYLLABLES:

| | | |
|---|---------------|-------------|
| 'ci ³ | ['ci:i:ʔ] | <10> |
| 'be ² | ['-be:] | <wind> |
| .*zi ² 'la ² ¹ | [.*si'li:a:] | <fever> |
| 'lu ¹ ² | ['li:u:] | <root> |
| be ² 'lo ³ ¹ | [-be'lo:] | <butterfly> |

When two vowels come together across syllable boundaries and the second vowel is stressed, the stressed vowel is equal in length to the vowel of a stressed open syllable and the vowel in the stressed syllable preceding lenis consonant. For example:

| | | |
|--|-------------|----------|
| za ² ge ² 'o ¹ ² | [sa-ge'o:] | <coyote> |
|--|-------------|----------|

When two vowels come together across syllable boundaries and the first vowel is stressed they are both short but the first vowel appears to be somewhat longer than the second vowel. This is further described in section 5.2.3.

PRECEDING LENIS CONSONANTS IN STRESSED SYLLABLES:

| | | |
|--|--------------|-------------|
| 'i ² ³ na ³ | ['i:n^ʔ] | <chili> |
| 'ne ¹ -da ² | ['ne:-d^] | <path> |
| '-da ³ ¹ bu ² | ['-da:-bu] | <lima bean> |

3.2.1 High tone is characterized as being high and level, although when it occurs on an unstressed open syllable, it is phonetically slightly lower. Examples of words with high tone follow:

| In stressed syllables: | In unstressed syllables: |
|--|---|
| 'rea ¹ <thick> | 'bi ¹ a ¹ <prickly pear cactus> |
| pi ² 'ru ¹ <type of tree> (Spn loan) | .*zi ² 'du ¹ ca ¹ <humming bird> |
| 'zi ¹ ta ² <egg> | 'bi ² ni ¹ <bird> |
| 'ne ¹ -da ² <road> | .*zu ¹ 'la ² li ² <plot of ground> |
| 'me ¹ e ¹ <swing> | 'na ¹ a ¹ <cultivated> |

High tone on an interrupted vowel is realized phonetically as high on the first vocoid and slightly lower on the second vocoid.

| | | |
|--------------------|------------------------|----------|
| '.*ze ¹ | ['.*se ¹ e] | <wide> |
| 'la ¹ | ['la ¹ a] | <broken> |

3.2.2 Mid tone is characterized as being mid and level. Mid tone stays at this same level even in unstressed syllables and across word boundaries until there is an intervening non mid tone. Mid tone when associated with an interrupted vowel has a slightly lower allotone on the second vocoid. Mid tone is the most common tone found in unstressed word-initial syllable. Examples of words with mid tone are:

In stressed syllables:

be²'-Ou² <adobe brick>

'*ze²ci¹ <thorn>

'i²*sa³ <flower>

'ci[?]nu² <12>

.*zi¹'na² <red>

In unstressed syllables:

'be¹la² <fire>

'la¹ri² <cloth>

u²'da³ma² <owl>

In secondarily stressed syllables:

"lu² <you singular>

3.2.3. Low tone is characterized as being low and level in word-medial position. In open syllables utterance-final low tone is always followed by phonetic lenis glottal closure (as described in section 2.2.1.). The lenis glottal closure causes stressed low tone to rise in pitch from low to mid-low and unstressed low tone to rise to a level mid-low allotone. Similarly, when a consonant closes a word-final syllable with low tone, low tone rises in pitch from low tone to a mid-low allotone. Because low tone in word-final position always ends at a low-mid allotone and because mid tone downsteps across word boundaries when interrupted by non mid tone, it is difficult to distinguish between unstressed low tone and mid tone word finally when not preceded by pause.⁽¹²⁾ Examples of words with low tone are:

In stressed syllables

be²'ku³ <altar>

be²'nu³ni³ <water fall>

'kua³ <floor, story>

.*zu²'ban³ <tail>

In unstressed syllables:

'-da²a³ <beans>

'te²-Ou³ <squash>

ku³'nu²ni³ <a kind of frog>

're¹la³ <night>

The unstressed clitic *.*si³* 'quickly' acts like a stressed low tone in word-medial position in that it does not rise to a level-mid allotone even though it is followed by lenis clottal closure. It is lower than the preceding unstressed low tone.

're²sa³+.*si³+lu² <you are meeting>

The unstressed clitic *nu³* does not occur utterance final but acts like a low in utterance final position in that it rises to a level mid-low allotone; that is, it is higher than a following stressed low tone.

nu³+za³ca³ <that which is dirty>

3.2.4. High-mid falling tone is characterized by a fall in tone from high pitch to high-mid pitch. High-mid falling tone occurs only in stressed syllables but not when followed by a fortis consonant. Examples of high-mid falling tone are:

'de¹² <ashes>
'.*zua¹² <corn>
'*zo?¹² <house>
'.*zi¹²bi¹ <road runner>
'.*zie¹²*za³ <bottle cap>
'la¹²a³ <it appears>

3.2.5. Mid-low falling tone is characterized by a fall in tone

from mid pitch to low pitch. Mid-low falling tone occurs only in stressed syllables when not followed by fortis consonant. Open syllables which occur with mid-low falling tone are checked phonetically by lenis glottal closure as described in section 2.2.1 and this results in low tone in this position being higher than low tone word medial. Examples of mid-low falling tone are:

'ba²³ <tomb>
 '*zua²³ <baggage>
 '-de²³zi¹ <a type of plant>
 '*zo²³du³ <church>
 'lua²³na³ <Etlá>
 'bi²³a¹ <prickly pear cactus>

3.2.6 Mid-high rising tone is characterized by a rise in tone from mid pitch to high pitch. Mid-high rising tone occurs only in stressed syllables but not when followed by fortis consonant. Examples of mid-high rising tone are:

.*zi²'la²¹ <fever>
 ku²'*ciu²¹ <tree trunk>
 'be[?]a²¹ <mushroom>
 'le[?]zi² <town>
 be²'.*zu²¹ra³ <charcoal>

3.2.7 Low-high rising tone is characterized by a rise in tone from low pitch to high pitch. It occurs only in stressed syllables but not when followed by fortis consonant. Examples of low-high tone are:

be²'lo³ <butterfly>
 '-de³.*zi² <dry bean pod>
 .*zu¹'ba³*za² <nettle> ?

4. Syllable

Four syllable patterns have been found to occur in WIZ. The four patterns are CV, V, CVC, and VC. Of the preceding patterns, CV occurs most frequently. The other patterns V, CVC and VC are common also although they are limited in distribution. CV and CVC can have either simple or complex nuclei while V and VC can only have simple nuclei. Following are examples of the four syllable patterns. Distribution of phonemes in the syllable is discussed in sections 4.1 and 4.2.

| | STRESSED SYLLABLE | UNSTRESSED SYLLABLE |
|-----|--|--|
| CV | 'gi ¹ <light> 'dua ² <agave cactus> | 'pe ² pi ¹ <fire fan> 'len ² -diu ³ <a type of plant> |
| V | 'e ¹ -0a ² <lightening> | u ² 'be ² a ² <broom> |
| CVC | '*cin ² ka ¹ <rooster> '*zi ¹ en ¹ <neck> | be.*z ² 'ku ² ni ¹ <thick tortilla> |

VC

'in²-da² <water> in²'-da²¹ <a type of cherry>

4.1 The syllable nucleus.

WIZ syllables may have either simple or complex nuclei.

4.1.1 The simple nuclei of WIZ syllables may be filled by any of the five vowels, although there are some restrictions determined by syllable pattern type, which govern the type of vowel that may occur (ie. whether or not interrupted vowels may occur, which plain vowels may occur). The following examples show all five vowels in an open syllable:

- 'gi¹² <light>
- 'de¹² <ashes>
- 'ta² <80>
- '.*so¹² <clothes>
- 'gu¹² <potato>

The occurrence of vowels and vowel types in the simple nucleus is limited in the following ways:

1. If the syllable consists of nucleus only, and precedes the stressed syllable, only non-low vowels occur except for one example in which /a/ is the syllable nucleus. There is only one example of /o/ occurring in this position and it fluctuates with /u/.

*Admitted
cannot be
written, saying*

- i²'-di²¹ <heavy>
- e²'gue²¹ <town of Aloapan>

| | |
|---|-------------|
| u ² 'be [?] a ² | <broom> |
| o ² '.*ze ¹ a ¹ u ² '.*ze ¹ a ¹ | <tomorrow> |
| a ² 'ne ¹ ga ² | <100 kilos> |

*what is it?
 7/10/24*

2. Only plain vowels occur in VC and CVC syllables (ie. interrupted vowels do not occur in these syllables except that in one example an interrupted vowel occurs in the CVC syllable pattern in stressed syllable.)

| | |
|-------------------------------------|------------------|
| 'in ² -da ² | <water> |
| i.*z ² 'ku ² | <3 legged stand> |
| .*zu ² 'ban ² | <tail> |
| '.*zi [?] ni ² | <son, daughter> |

3. Only /i/ occurs as the nucleus of VC syllables.

| | |
|--|---------------|
| 'in ² -da ² | <water> |
| i.*z ² 'di ² | <breakfast> |
| i.*z ² 'kua ¹ -di ¹ | <animal nest> |

4. Non back vowels most frequently occur in the simple nucleus of CVC syllables. /o/ does not occur as the simple nucleus in CVC syllables and /u/ occurs in one example only in the stressed CVC syllable.

STRESSED SYLLABLES:

UNSTRESSED SYLLABLES:

| | | |
|---|-----------|---|
| '.*zin ² | <nose> | |
| 'len ² -diu ² | <a plant> | be.*z ² 'ku [?] ni ¹ <soft tortilla> |
| .*zu ² 'ban ² | <tail> | |
| i.*z ² 'kun ¹ ci ² | <a plant> | |

4.1.2 Complex nuclei of WIZ syllables consist of two vowel segments. The first vowel is always /i/, /e/, or /u/. ✓ When the first vowel is /i/, the second vowel may be any vowel except /i/. *including /e/ & /u/* When /e/ is the first vowel, the second vowel is only /a/. When the first vowel is /u/, the second vowel may be any vowel except /o/ or /u/. ✓

In the complex vowel nucleus, the first vowel may be plain or interrupted. The second vowel is always plain. When the interrupted first vowel is /i/, the second vowel may be /e/, /a/, or /u/ but not /o/. When the interrupted first vowel is /u/, the second vowel is only /e/. As has been stated above the interrupted first vowel /e/ is followed only by /a/ in the complex nucleus.

4.2 Syllable margins. WIZ syllables may have either an onset margin, a coda margin or both. Syllables occurring with onset margins are the most common. Syllables with coda margins and those with both onset and coda margins occur less frequently. The syllable patterns show that only one consonant may occur in either the onset or coda margins. The consonants which may occur in the coda syllable are very limited.

Handwritten notes:
 + hi
 - huc
 + hi
 - huc
 * + hi
 - huc
 * + hi
 - huc

4.2.1 The onset margin consists of one consonant. Simple onset margins may consist of any consonant. Some examples of simple onset margins in syllable initial position follow:

| | |
|---------------------|--------------|
| 'de ¹² | <ashes> |
| 'ko ¹² | <no> |
| 'be ¹² | <crack> |
| '-da ¹² | <lard> |
| 'gi ¹² | <light> |
| '-Da ¹² | <wedding> |
| 'ce ²³ | <good> |
| 'za ¹² | <day> |
| '.*zo ¹² | <clothes> |
| '*za ²¹ | <steam bath> |
| 're ¹² | <pitcher> |
| 'lu ¹² | <root> |

The consonant in an onset syllable is usually /n/ or /z/ when following an open syllable filled by an interrupted vowel. As mentioned in section 1, these consonants are lengthened in this position. /z/ and /.*s/ have been found in this position only in compound words.

| | | |
|-------------------------------------|---|---------------|
| 'ze ²³ na ² | ['*ze ²³ en [^]] | <plate> |
| 'be ²² *za ² | ['-be ²² e*z [^]] | <knot> |
| 'le ²³ .*si ² | ['l:e ²³ e.*s:i [?]] | <field compd> |

what's the point?

When /d/ occurs in the onset syllable following a closed syllable, it is lengthened as described in section 1.

why is this here?

how do this relate?
 'duntu [ˈtuntu] <naked>
 i.*z'danda [i.*s'tantʰ] <billowing>
length:

Mistake here?

4.2.2 The coda margin consists of one consonant. The consonants which occur most frequently in the coda margin are /n/ and /z/. /z/, /m/, /l/ and /r/ occur in this position only in polymorphemic and loan words. A CVC syllable with a complex nucleus has only /n/ in the coda margin. Only /n/ occurs in the coda margin of a stressed CVC syllable.

/gen/

| CVC-complex nucleus | | CVC-simple nucleus | |
|----------------------|---|---|------------------------------------|
| '*zien ¹² | <neck> | '.*zin ²¹ | <nose> |
| 'cuin ²³ | <drop> | '-dan ²³ | <sibling of the opposite sex> |
| | | laz ²² 'do ²³ | <liver compd.> |
| | | be.*z ²² 'ku ²² ni ¹ | <thick tortilla> |
| | | | VC |
| | 'in ² -da ² | | <water> |
| | i*z ²² 'ku ²³ | | 3 legged stand> |
| | ir ²² 'ze ¹ | | <supper> <i>compd.</i> |
| | al ² 'de ¹ .*za ²² | | <large wooden trough (Spn artesa)> |

03
his
?

loan

4.3 Every syllable carries one of the seven basic tones: high 1, mid 2, low 3, high-mid falling 12, mid-low falling 23, mid-high rising 21 or low-high rising 31.

high 'be¹.*su²³ <cry baby>

| | | |
|------------------|------------------------------------|----------|
| mid | 'be ² | <wind> |
| low | 'be ³ .*si ¹ | <tomato> |
| high-mid falling | 'be ¹² | <crack> |
| mid-low falling | 'be ²³ zu | <dry> |
| mid-high rising | 'be ²³¹ | <ring> |
| low-high rising | 'be ² e ³¹ | <nit> |

5. Word

The WIZ word consists of one stressed (or primarily stressed) syllable. (A polymorphemic word may also have 1 or 2 secondarily stressed syllables, as described in section 5.3) Monomorphemic words consist of one, two or three syllables. Polymorphemic words may consist of from two to nine syllables, or possibly more, but for words to consist of more than eight syllables is rare.

5.1 Stress in WIZ is contrastive, as seen in the following examples:

| | |
|-----------------------------------|---------------|
| 'du ¹ la ² | <sin> |
| du ¹ 'la ² | <large shawl> |
| 'be ¹² ga ² | <gourd> |
| be ² 'ga ² | <necklace> |

2'2'la² is known as a shawl in WIZ.

However, in most cases, stress is predicatable, as it usually occurs on the penultimate syllable of the word. (In polymorphemic

words stress occurs on the penultimate syllable of the word stem.) When stress does not occur on the penultimate syllable, it occurs on the final syllable. Examples of word final stress follow:

| | |
|---|----------|
| be ² '-0ia ¹² | <eagle> |
| be ² ' <u>la</u> ? ²¹ | <ravine> |
| .*zu ² 'ban ³ | <tail> |

There are a few words which function on the phrase level and have no stress. The length of the vowels in these words is the same as the length of vowels in unstressed syllables. For example:

| | | |
|---------------------------------|--------|-----------|
| ki ² ni ¹ | [kini] | <because> |
| <u>na</u> ² | [n:a] | <and> |

5.2 A greater variety of syllable types, as well as more tones, occur in stressed syllables than in non-stressed syllables, as will be seen in this section.

5.2.1 Stressed syllables: Any of the syllable types may occur as the stressed syllable of the word. Any of the syllable types, except VC, may occur as a word. Furthermore, any of the seven basic tones may occur on stressed syllables.

Monosyllabic examples:

| | |
|----------------------|--------------------|
| 'o ¹² | <yes> |
| 'gu ¹² | <potato> |
| 'kua ³ | <story of a house> |
| '.*zin ²¹ | <nose> |

Polysyllabic examples:

| | |
|---|-------------|
| i ² '-di ¹ la ³ | <cold> |
| 'in ² -da ² | <water> |
| bi ¹ '*jin ² *ji ² | <a plant> |
| 'be ² la ¹ | <meat> |
| '-da ³ bu ² | <lima bean> |

5.2.2 Prestressed syllables: No more than one prestressed syllable occurs in a monomorphemic word.

Only plain vowels may occur in prestressed syllables. Either high, mid or low tone may occur, although mid tone by far is the most common. Rising and falling tones do not occur on prestressed syllable. Any of the syllable types may occur as a prestressed syllable.

| | |
|---|------------------|
| .*zu ¹ 'ba ³ *za ³ | <nettle> |
| be ² 'dua ² | <banana> |
| ku ³ 'nu ¹ ni ³ | <tad pole> |
| u ² 'da ¹ ma ² | <owl> |
| in ² '-de ¹ -Oa ² | <perspiration> |
| be.*z ² 'ku ² ni ¹ | <thick tortilla> |

There are several words with two prestressed syllables which appear to be monomorphemic because the parts of the word cannot be identified. Yet it is probable that these words have resulted from the compounding of two morphemes, resulting in two prestressed syllables.

| | |
|---|----------|
| za ² ge ² 'o ¹ 2 | <coyote> |
|---|----------|

be²ru³'be² <snail>

e²ru³'lo² <carbon>

Polymorphemic words may have two prestressed syllables. These are considered as one phonological word, however, in that they have only one stressed syllable.

na²na²'de¹ <later>

o².*ze²'di¹la² <tomorrow>

The clitic plural marker ka²- has no stress and can attach itself to the front of any noun to form phonological words with up to three prestressed syllables.

ka²'be¹ku² <dogs>

ka²be³'re¹ <ants>

ka²be²ru³'be² <snails>

The unstressed clitic nominalizer nu³- can attach itself to the front of adjectives to form phonological words with more than one prestressed syllable.

nu³.*zi¹'na² <red>

nu³bi²'*zu¹ <man>

ka²nu³bi²'*zu¹ <men>

5.2.3 Post-stressed syllables: No more than one post-stressed syllable occurs in a monomorphemic word. Only CV and V syllable patterns occur in post stressed syllables. Either high, mid or low tone may occur:

| | | |
|----|--|--------|
| CV | be ² 'zi ² na ¹ | <deer> |
| CV | '*ce ² nia ² | <19> |
| V | '-da ² na ³ | <bean> |

The syllable V can follow the syllable CV to form two syllables CVV without an intervening consonant between the vowels. Following are arguments for interpreting V as a post-stressed syllable:

2
6
V¹

a. When V occurs as a post stressed syllable, the two vowels together in the resulting 'CVV syllable pattern are longer than a long vowel even though the vowel in a stressed open syllable and before a lenis consonant is lengthened to about two mores of length. (13)

| | | | | | |
|-----------------------------------|-----------|--------------------------|----------------------------------|-----------|-----------|
| 'me ¹ e ¹ | ['me*e] | <swing> | 'ze ¹ la ² | ['se:l^] | <mixture> |
| 'bi ² na ¹ | ['-bi*^] | <prickly pear cactus> | 'ba ² | ['-ba:] | <tomb> |
| '.*ze ¹ a ¹ | ['.*se*^] | <tar> | be ² 're ³ | [-be're:] | <ant> |

b. The tone patterns occurring on CVV syllable patterns occur on two syllable words.

| CVCV words | | CVV words | |
|--------------------------------------|---------------|-----------------------------------|--------------------------|
| '.*zi ¹ bi ¹ | <road runner> | 'me ¹ e ¹ | <swing> |
| '.*zi ² la ² ? | <cotton> | 'bi ² na ¹ | <prickly pear cactus> |
| '.*sa ² na ³ | <owner> | '-da ² na ³ | <bean> |

In most words of this nature, one of the tones is a falling tone and the other either a high-level or low-level tone. The level tone may precede the falling tone as shown in the following word:

za²ge²'o¹² <coyote>

c. To interpret CVV words as having one syllable instead of two would mean positing the following three additional tones, as found in only about a dozen words:

| | | |
|--------------------|------------------------------------|---------|
| high-mid high tone | '.*ze ¹² a ¹ | <tar> |
| mid-low high tone | 'be ²³ o ¹ | <month> |
| mid-low low tone | 'du ²³ u ³ | <rope> |

d. The phonetic quality of a word-final high in CVV words is the same as the phonetic quality of high tone in unstressed syllables of other word types. High tone in unstressed syllables is slightly lower than high tone in stressed syllables (see section 3.2.1). In CVV words ending in high tone, the final high tone is slightly lower. This indicates that the vowel occurring with final high tone is functioning as an unstressed syllable.

| | |
|----------------------------------|---------|
| 'me ¹² e ¹ | <swing> |
| 'be ²³ e ¹ | <nit> |

e. The phonetic quality of a word-final low in CVV words is not the same as the phonetic quality of a word-final mid-low falling in CV words. As described in section 3.2.3 low tone in an open syllable utterance-final is always followed by phonetic lenis glottal closure which causes low tone to rise to a level mid-low allotone. The word-final low in CVV words is a mid-low allotone. This indicates that the vowel occurring with final low tone is functioning as a separate syllable and not as part of the mid-low falling tone preceding it.

'da²³a³ [/'-daa?] <lard> 'ba²³ [/'-ba?] <tomb>
 'du²³u³ [/'tuu?] <rope> 'ce²³ [/'c:e?] <good>

f. The fact that V¹² + V¹ and V²³ + V¹ are phonetically the same as V¹²V¹ and V²³V¹ also provides evidence that CVV words should be considered to consist of 2 separate syllables, rather than one syllable with a more complex tone pattern.

'me¹²e¹ <swing> 'be²³e¹ <nit>
 'gu¹² + a¹ <potato, not here> 'ba²³ + a¹ <tomb, not here>
 las²'do³ + e¹ <liver, his>

When the syllabic morpheme a¹ <not here> is added to CVV words, extremely complex tones are added if a¹ is not considered to be syllabic as shown by the following examples.

'me¹²e¹²+a¹ <swing, not here> ¹⁴
 'be²³e¹²+a¹ <nit, not here>

g. In monomorphemic words, glides occur only in stressed syllables (see section 5.2.1). The syllable V can occur with a high-mid falling tone as shown in the following word:

za²ge²'o¹² <coyote>

To posit stress as occurring on the syllable beginning with /g/ of the above word would mean positing yet another tone, mid-high-mid falling, on the basis of one word.

If a stressed vowel with a falling tone can be preceded by mid level tone, za²ge²'o¹² <coyote>, then the reverse, a stressed vowel with a falling tone followed by a level high tone, 'me¹²e¹ <swing>,

should also be true.

h. Stressed vowels may be followed by C or CV, and the most common word pattern is the bi-syllabic pattern. CVV words are rarely followed by C or CV. It is consistent with existing syllable and word patterns to posit V as a syllable following 'CV.

There is only one example in the data in which CVV is followed by CV. In this case, however, the second vowel is stressed which is consistent with existing syllable patterns.

ku¹ 'u²ku²

<dove>



In polymorphemic words four to five post stressed syllables may occur. These are considered to be phonological words because they have only one stressed syllable. The bound person markers -ni² and -na² <3rd person, common> occur in post-stressed syllables. They receive no secondary stress as do the other bound person markers (see section 5.3).

'ru²xa²na²

<he/she/it is carrying (on the back)>

'na²ga²ni²

<his/her/its ear>

The unstressed location clitic -a¹ <not here> may occur with various words to form polymorphemic words of more than one post-stressed syllable with a variety of tone patterns as described in section 8.7.

'me¹e¹a¹

<swing, not here>

be²'-di²na²a¹

<rat, not here>

When the unstressed plural clitic ka²- occurs with the third person, common, person markers -ni³ and -na² polymorphemic words of three post-stressed syllables are formed.

| | |
|--|-------------------------------------|
| 'ru ² xa ³ ka ² na ² | <they are carrying, on their backs> |
| 'na ² ga ² ka ² ni ² | <their ears> |

5.3 Secondly stressed syllables occur only in polymorphemic words.

All bound person markers except <3rd person common> and <1st person plural, inclusive> receive secondary stress. The vowel of these secondarily stressed person markers is phonetically checked by a lenis glottal closure in utterance final position. As described in section 2.2.1 lenis glottal closure occurs with low tone in utterance final position. However, secondarily stressed syllables occur with the same lenis glottal closure in utterance-final position regardless of the tone.

| | | |
|---|--------------|-----------------------|
| ru ² 'de ³ "lu ² | [ru'te:"lu?] | <you-sg. are giving> |
| ru ² 'de ³ "le ¹ | [ru'te:"le?] | <you-pl. are giving> |
| ru ² 'de ³ "tu ² | [ru'te:"tu?] | <we-excl. are giving> |

Only secondarily stressed bound person markers are phonetically closed by lenis glottal closure. The bound 3rd person common markers, -ni³ which is suffixed to inalienably possessed nouns and some verbs, and -na² which is suffixed to any other verbs, are not secondarily stressed and are not phonetically closed by lenis glottal closure.

| | | |
|--|-------------------------|----------------|
| ru ² 'de ³ na ² | [ru'te:n [^]] | <he is giving> |
| 'lo ¹ ni ³ | [l'o:ni] | <his face> |

The 1st person plural inclusive ri¹ is not closed by glottal stop and receives primary stress. It is not bound but occurs as a word by itself.

| | | |
|---|---------------|-----------------------|
| ru ² 'de ³ 'ri ¹ | [ru'te:'ri?i] | <we-incl. are giving> |
|---|---------------|-----------------------|

The demonstrative pronouns -ni³ <here> and -na² <there> are bound and receive secondary stress. The vowel of these secondarily stressed demonstrative pronouns is phonetically checked by lenis glottal closure in utterance-final position just as the bound person markers are and occurs with any tone, not just low tone as described in section 2.2.1.

| | | |
|---|---------------------------|------------|
| 'zi ¹ ta ² "ni ³ | [siti: [^] "ni?] | <this egg> |
| 'zi ¹ ta ² "na ² | [siti: [^] "na?] | <that egg> |

The bound secondarily stressed augment markers -do¹ <to make little or endear> and -do³ <to intensify or enlarge> occur with the same lenis glottal closure in utterance-final position regardless of tone. The vowel of the augment markers, unlike the vowel of bound person markers and demonstrative pronouns, is the same length as a vowel in a stressed open syllable.

| | | |
|--|--------------------------------|------------|
| nu ² bi ² '*zu ¹ "do ¹ | [nubi'*zu"to:?)] | <boy> |
| 'i ² *za ¹ "do ¹ | [i*:z: [^] "to:?)] | <flower> |
| in ² -da ³ "do ³ | [i:nd [^] "to:?)] | <ocean> |
| 'xi ¹ *za ² "do ³ | [xi?i*:z: [^] "to:?)] | <mountain> |

There is one example of what appears to be a frozen word in which -do¹² <to make little or endear> receives primary stress because it is nominalized by the unstressed clitic nu-² to form a word.

nu²'do¹² [nu'to:ʔ] <little one, child>

6. Spanish Loans

Two other consonantal phonemes and a variety of consonant clusters which are found only in Spanish loans are found in WIZ. Most of the Spanish loans are characterized by a typical tone pattern.

6.1 The two phonemes which occur only in Spanish loan words are:

a. A labial-dental fricative: /f/

fer'nan-du <Ferdinand (Sp. Fernando)>

fe'breru <February (Sp. febrero)>

ka'fe <coffee (Sp. cafe)>

b. An alveopalatal nasal: /~n/

ku~nadu <brother-in-law (Spn. cu~nado)>

kumpa~naru <companion (Spn. compa~nero)>

6.2 Consonant and vowel clusters occur in Spanish loans.

These consonant clusters result in a new syllable pattern CCV being added to the WIZ syllable inventory. They may occur at the beginning of words. A consonant is usually not deleted or a vowel added to make the cluster conform to the established

syllable patterns. For example:

Word-initial consonant clusters:

| | | |
|------|-----------|--------------------------|
| /pr/ | pri'-meru | <first (Sp. primero)> |
| /tr/ | 'drazdi | <dishes (Sp. traste)> |
| /br/ | 'bringu | <foreigner (Sp. gringo)> |
| /gr/ | 'gra-du | <'grade (Sp. grado)> |
| /kl/ | 'klabu | <nail (Sp. clavo)> |

In one example a vowel is added to make the cluster conform to the established syllable patterns.

| | | |
|------|---------|--------------------|
| /kr/ | ka'ruzi | <cross (Sp. cruz)> |
|------|---------|--------------------|

Consonant clusters may also occur word medially. To break up the cluster by assigning the consonant to the preceding syllable would result in syllables in which the coda margin would be filled by phonemes which never occur in this position in words which are not Spanish loans. For example:

Word-medial consonant clusters:

| | | |
|-------|-----------|--------------------------|
| /br/ | fe'breru | <February (Sp. febrero)> |
| /-dr/ | 'bi-dru | <glass (Sp. vidrio)> |
| /fr/ | re'fresku | <pop (Sp. refresco)> |
| /gr/ | 'zugra | <sugar (Sp. azucar)> |
| /bl/ | 'pablu | <Paul (Sp. Pablo)> |

/r/ is the most frequent second consonant of a cluster but /l/ also occurs in this position, with voiced and voiceless stops most

commonly occurring as the first consonant.

Three consonants can occur together word-medially when a closed syllable is followed by a consonant cluster.

| | |
|------------|------------------------------|
| ku'lantru | <coriander (Sp. culantro)> |
| 'mestru | <teacher (Sp. maestro)> |
| se'tiembri | <September (Sp. septiembre)> |

In one example the second member of the consonant cluster is lost when three consonants occur together.

| | |
|------------|----------------------|
| .*zum'pelu | <hat (Sp. sombrero)> |
|------------|----------------------|

All vowel clusters which occur in WIZ words, except /ea/, are also found in Spanish loans. Vowel clusters in Spanish loans are realized as diphthongs with the non-high second vowel being lengthened and the first high vowel being peripheral to it. When both vowels are non-high, the last vowel is phonetically lengthened. Vowels in stressed syllables are phonetically long.

| | | |
|--|--------------|------------------------------|
| '-dio ¹ zi ² | [ˈdio:si] | <god (Spn. dios)> |
| 'pa ² 'zia ¹ ri ² | [paˈsia:ri] | <walk (Spn. paseo)> |
| 'mier ¹ ku ² li ² | [ˈmie:rkuli] | <Wednesday (Spn. miercoles)> |
| 'xue ¹ bi ² | [ˈxue:-bi] | <Thursday (Spn. jueves)> |
| 'xuan ¹ | [ˈxua:n] | <John (Spn. Juan)> |
| 'leo ² ni ² | [ˈleo:ni] | <lion (Spn. leon)> |
| mu ² 'ra ¹ li ² | [muˈr:a:li] | <bag (Spn. morral)> |

Word-final vowel clusters /ia/ and /io/ are simplified in

Spanish loans by retaining the first high vowel and dropping the second low vowel. For example:

$$V_{\alpha} V_{\beta} \rightarrow V_{\alpha} / - \#$$

| | |
|-----------|----------------------------|
| u.*z'tizi | <authority (Sp. justicia)> |
| '*jibi | <Sylvia (Sp. Silvia)> |
| ra'me-di | <remedy (Sp. remedio)> |
| 'xuli | <July (Sp. julio)> |

There are a few examples of the high first vowel of the cluster dropping out and the second vowel being retained.

| | |
|---------|----------------------------|
| 'lona | <Apolonia> |
| 'bi-dru | <glass (Sp. vidrio)> |
| 'pa*ju | <Boniface (Sp. Bonifacio)> |

The old form of <Maria> retains both the /i/ and the /a/: ba'lia.

6.3 Spanish loans in WIZ are usually, but not always, stressed on the penultimate syllable with high tone occurring on the stressed syllable. Pre- and post-stressed syllables are usually mid tone. There are only four words in the data where the stressed syllable does not occur with high tone. At least three of these are of Aztec origin.

Spanish loans:

| | |
|---|------------------------------|
| 'zu ¹ gra ² | <sugar (Sp. azucar)> |
| re ² 'frez ¹ ku ² | <pop (Sp. refresco)> |
| pre ² zi ² '-den ¹ di ² | <president (Sp. presidente)> |

Others:

| | |
|----------------------------------|----------------------|
| 'bu ² ru ² | <donkey (Sp. burro)> |
| 'na ² na ¹ | <mother (Sp. madre)> |
| 'da ² da ¹ | <father (Sp. padre)> |
| 'mi ² zi ³ | <cat (Sp. gato)> |

Exceptions to the above are words whose stress in Spanish is not on the penultimate syllable. The Spanish loan assumes the stress of the Spanish word.

| | |
|--|--------------------------|
| 'za ¹ ba ² du ² | <Saturday (Sp. sabado)> |
| 'zin ¹ -di ² ku ² | <trustee (Sp. sindico)> |
| ku ² mi ² 'te ¹ | <committee (Sp. comite)> |

6.4. When words are borrowed from Spanish into WIZ, word-finally a vowel is added or a consonant deleted to conform the syllable pattern of the loan word to the established CV syllable pattern.

| | |
|---------|----------------------|
| za'beli | <Isabel> |
| 'lapi | <pencil (Sp. lapiz)> |

/i/ is frequently added to word-final syllables closed by a consonant to form the common CV syllable pattern. Some examples follow:

| | |
|-----------|--------------------------|
| a'brili | <April (Sp. abril)> |
| kam'pioni | <cemetery (Sp. panteon)> |
| mi'geli | <Michael (Sp. Miguel)> |

Word final vowel cluster, especially those having /o/ or /a/ as the second vowel, usually delete the /o/ or /a/ to form the more common Spanish loan syllable pattern having /i/ as the final vowel. For example:

| | |
|------------|------------------------------|
| ra'medi | <remedy (Sp. remedio)> |
| zekre'dari | <secretary (Sp. secretario)> |
| 'xuli | <July (Sp. julio)> |
| 'dori | <Victoria (Sp. Victoria)> |
| 'demi | <Artemio (Sp. Artemio)> |

Sibilants are deleted word-finally to form the more common CV syllable pattern. Some examples follow:

| | |
|--------|-------------------------|
| 'lapi | <pencil (Sp. lapiz)> |
| 'mardi | <Tuesday (Sp. martes)> |
| 'xuebi | <Thursday (Sp. jueves)> |
| 'peli | <Felix (Sp. Felix)> |

It is not uncommon for Spanish loan words to have two prestressed syllables, although one or none is more common and it is rare for loan words not to have at least one post-stressed syllable. Most frequently Spanish loan words are (S)'SS. For example:

| | |
|--------------|------------------------------|
| 'luni | <Monday (Sp. lunes)> |
| -du'minku | <Sunday (Sp. domingo)> |
| prezi'-dendi | <president (Sp. presidente)> |
| 'mierkuli | <Wednesday (Sp. miercoles)> |
| ka'fe | <coffee (Sp. cafe)> |

In forming common names pre-stressed syllables are frequently dropped to conform to the more common bisyllable word pattern as shown by the following examples:

| | |
|-------|-------------|
| 'dina | <Augustina> |
| 'lipi | <Felipe> |
| 'nari | <Apolinar> |

6.5 There are some fairly regular phoneme substitutions that occur when Spanish words are borrowed into WIZ. Whether or not these substitutions occur often depends on the length of time that the loan has been in the language. The following is not meant to be exhaustive but merely a listing of the most common changes in older loans. The environment in which these substitutions occur is not always determined.

6.5.1 Vowel raising

$e \rightarrow i$ / in an unstressed syllable

In non-stressed syllables in Spanish loan words /e/ becomes /i/. That /e/ is not a strong vowel in the unstressed syllable word-finally is shown by the fact that it occurs rarely in this position in WIZ words (as described in section 3). Word-finally the rule deleting word-final consonant usually occurs first and then /e/ becomes /i/.

| | |
|------------------|-----------------------------|
| <u>ma</u> '*cedi | <large knife (Sp. machete)> |
| ' <u>ma</u> rdi | <Tuesday (Sp. martes)> |
| iz'kuela | <school (Sp. escuela)> |

rixi'-dori <councilman (Sp. regidor)>

6.5.2 Vowel raising

o → u / in an unstressed syllable

/o/ does not occur in an unstressed syllable in WIZ (see section 2). Thus, /o/ becomes /u/ in unstressed syllables in Spanish loan words.

ze'ri*zu <match (Sp. cerillo)>

mu'linu <mill (Sp. molino)>

'mozu <servant (Sp. moso)>

6.5.3 Changes occur in Spanish loans in voicing and devoicing of stops. Voiceless stops, except dentals, may become voiced and there are a few examples of voiced stops becoming voiceless. Because environment is not conditioning these changes, it may be that the length of time the loan has been in use in WIZ determines whether or not a change occurs.¹⁵ For example:

Voiceless to voiced

| | | | | |
|---|---|---------------------------------|------------|--------------------------------|
| p | b | 'bindu <pinto (Sp. pinto)> | but | 'piku <pick (Sp. pico)> |
| k | g | '.*zu.*zgu <furrow (Sp. surco)> | but | re'frezku <pop (Sp. refresco)> |

Voiced to voiceless

| | | | | |
|----|---|----------------------------------|------------|-----------------------------------|
| b | p | .*zum'pelu <hat (Sp. sombrero)> | but | 'be.*zdu <Albert (Sp. Alberto)> |
| -d | d | 'zaba-du <Saturday (Sp. sabado)> | but | man'-da-du <errand (Sp. mandado)> |
| g | k | -du'minku <Sunday (Sp. domingo)> | but | '*jangu <monkey |

6.5.4 Fricative fronting

x → *z / V _ V
-back
-high

The velar fricative /x/ occurring in Spanish loan words becomes the alveopalatal fricative /*z/ between two vowels where the second vowel is not back and not high. For example:

| | |
|----------|------------------------|
| na'ra*za | <orange (Sp. naranja)> |
| 'te*za | <roof tile (Sp. teja)> |

but

| | |
|---------|-----------------------|
| ku'nexu | <rabbit (Sp. conejo)> |
|---------|-----------------------|

6.5.5 Sibilant backing

In many Spanish loan words the fricative /s/ is backed to become the retroflexed fricative, the alveopalatal affricate or the fortis alveolar fricative. It is not always possible to determine the environment in which these changes occur. It may be that the length of time which the loan has been in use, determines whether or not the /s/ is backed. The castilian /s/ is often realized as [*s] and the older the loan the more likely it stems from a peninsular pronunciation.

a.) s → .*z/ — V
[+ high]

Word-initial /s/ usually becomes the alveopalatal retroflexed fricative /*z/ before high vowel when no syllables have been dropped

to form the loan word and the word is not a common name.

| | |
|------------|----------------------|
| '.*zila | <chair (Sp. silla)> |
| .*zum'pelu | <hat (Sp. sombrero)> |

Following is an exception in which word-initial /s/ followed by high vowel does not become /.*z/ but remains /z/.

| | |
|-----------|-------------------------|
| 'zin-diku | <trustee (Sp. sindico)> |
|-----------|-------------------------|

$$s \rightarrow .*z / \underset{[\text{front}]}{V} \text{ ______ } \underset{[\text{front}]}{V}$$

Word-medial /s/ becomes /.*z/ between two vowels in which one vowel is front and one is back.

| | |
|------------------|----------------------------|
| 'be.*zu | <Mexican money (Sp. peso)> |
| ' <u>me</u> .*za | <table (Sp. mesa)> |
| ' <u>ma</u> .*zi | <Tom (Sp. Tomas)> |

$$s \rightarrow .*z / \text{___} C$$

Word-medial before a consonant environment does not seem to determine whether /s/ becomes /.*z/ or remains /z/.

| | |
|----------------------|---------------------------------|
| bi.*z'kali | <attorney general (Sp. fiscal)> |
| k'wa're.*z <u>ma</u> | <lent (Sp. cuaresma)> |
| u.*z'dizi | <authority (Sp. justicia)> |

but

| | |
|----------------|------------------------|
| iz'kuela | <school (Sp. escuela)> |
| 'raz <u>mu</u> | <Erasmus> |
| a'gozdu | <August (Sp. agosto)> |

b.) s → *j / in common names

In common names the alveolar fricative /s/ becomes the alveo-palatal affricate /*j/ when pre-stressed syllables have been dropped to form the Spanish loan or when /s/ occurs word-initially in the stressed syllable.

WORD-INITIAL

| | |
|---------|---------------------------|
| '*jinda | <Jacinta> |
| '*ju*ju | <Jesus (Sp. Jes/us)> |
| '*jika | <Frances (Sp. Francisca)> |
| '*jibi | <Sylvia (Sp. Silvia)> |

The following are two exceptions in which /s/ does not become /*j/ but remains /z/.

| | |
|-------|-------------------------|
| 'ziku | <Frank (Sp. Francisco)> |
| 'zebi | <Eusebia> |

WORD-MEDIAL

| | |
|---------|----------------------------|
| 'pa*ju | <Boniface (Sp. Bonifacio)> |
| 'ne*ji | <Inez (Sp. Inez)> |
| '*je*ji | <Moses (Sp. Moises)> |

but

| | |
|---------|-----------------------|
| '-drezi | <Andrew (Sp. Andres)> |
|---------|-----------------------|

c.) s → s

There are two examples in which the Spanish alveolar fricative /s/ becomes the fortis alveolar fricative /s/ in WIZ.

| | |
|-----------------|---------------------|
| 'sera ['s:e:r^] | <candle (Sp. cera)> |
|-----------------|---------------------|

'dusa ['tus:ʌ]

<prairie dog>

6.5.6. /f/ fronting.

f → p/b

/f/ as a phoneme in WIZ occurs only in relatively recently borrowed Spanish loan words. In loan words that have been in the language for some time, /f/ has become a bilabial stop.

f → b /

/f/ becomes a voiced bilabial stop unstressed, word-initial.

bi.*z'kali

<district attorney (Sp. fiscal)>

elsewhere, /f/ becomes a voiceless bilabial stop.

'peli

<Felix>

'*jepa

<Josephine (Sp. Josefa)>

'dolpu

<Adolf (Sp. Adolfo)>

7. The WIZ segmental phonemes are charted as follows. (Consonants which occur only in Spanish loans are placed between parenthesis in the chart.):

CONSONANTS

OBSTRUENTS

| | | labial | inter- labial dental | dental | dental | alveolar | palatal | retro flexed alveo- palatal | velar |
|-----------------------|---|--------|-------------------------|--------|--------|----------|---------|--------------------------------------|-------|
| fortis: stops | p | | | | t | | | | k |
| lenis: | b | | | | d | | | | g |
| fortis: affricates | | | | | | c | *c | | |
| lenis: | | | | | | | *j | | |
| fortis: fricatives | | (f) | -θ | | | s | *s | .*s | x |
| lenis: | | | -d | | | z | *z | .*z | |

SONORANTS

| | | | | | | | | | |
|---------------------|----------|--|--|--|--|----------|------|--|--|
| fortis: nasals | <u>m</u> | | | | | <u>n</u> | | | |
| lenis: | | | | | | n | (~n) | | |
| fortis: laterals | | | | | | <u>l</u> | | | |
| lenis: | | | | | | l | | | |
| fortis: vibrants | | | | | | <u>r</u> | | | |
| lenis: | | | | | | r | | | |

| | Front | Central | Back |
|-------|-------|---------|------|
| High: | i/i? | | u/u? |
| Mid: | e/e? | | o/o? |
| Low: | | a/a? | |

TONE

| | |
|-------------------|----|
| high tone: | 1 |
| mid tone: | 2 |
| low tone: | 3 |
| high-mid falling: | 12 |
| mid-low falling: | 23 |
| mid-high rising | 21 |
| low-high rising | 31 |

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8. Morphophonemics

In this section both phonologically and grammatically conditioned morphophonemic rules are presented as they apply primarily to the nouns and their affixes. The rules, however, have been expanded to include the verbs and their affixes where applicable. The rules are presented in a very loose generative framework and are not ordered.

8.1 High tones across syllable and morpheme boundaries.

1 12 / 1

When two high tones come together with no intervening consonant, the first high tone becomes high-falling tone before the second high tone. The second high tone is slightly lower than the first high tone, with the same phonetic qualities as when tones 12 and 1 occur together within a word, with an intervening syllable boundary.

Across syllable boundaries:

'me¹²e¹ <swing>
'*.z¹²e¹²a¹ <tar>

Across morpheme boundaries:

pi²'ru¹ <a plant> + -a¹ <not here> pi²'ru¹²a¹ <plant, not
here>
'lu²za¹ <tongue> + -e¹ <his, respect> 'lu²ze¹²e¹ <his-respect
tongue>

(/a/ becomes /e/ preceding the morpheme -e¹ as described in section 8.3)

Because of tone perturbation:

e¹'gua¹² <will plough> + *ru² <more> + lu² <2nd sing.>

e¹'gu¹²a¹ru²lu² <you will plough more> (14) ✓

*ru²'ka³¹ <is stretching> ++za³ <1st sing> *ru²'ka¹²a¹*za³ <I am
stretch>  causing to

(Section 8.7 describes the perturbation which occurs with first
person singular and vowel insertion is described in section
8.10.)

However, when two /e/'s come together across syllable boundaries
and when they occur with a tone rising to high preceding a high tone,
the tone rising to high does not drop to mid preceding the affixed
/e/ with high tone because stem /e/ cannot insert another syllable
which would be necessary to carry the new tone. (See sec. 8.10 for
vowel insertion rule.) Instead, in this environment the tone rising
to high does not drop to mid and is followed by high tone which is
phonetically slightly lower than high of a stressed syllable because
it occurs in a secondarily stressed syllable.

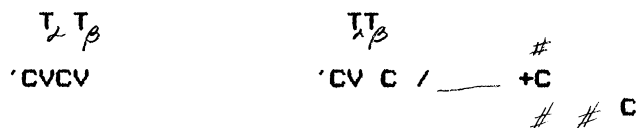
'na²¹ <hand> + -e¹ <3rd sg.> 'ne²¹e¹ <his respect hand>

8.2 Tone stability

As will be described in section 8.5, in certain environments
the final vowel of 'CVnV words, if it is /i/ or /a/, is lost.
Preceding vowel person morphemes and optionally across word
boundaries when preceding consonant, /i/ and /a/ are manifested
in the surface form. When these vowels have a tone which is not

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the same as the tone on the vowel preceding /n/, the tone on the underlying vowel is not lost when the vowel is deleted word finally but is transferred to the vowel preceding /n/. If the tone of the underlying vowel is the same as the tone of the vowel preceding /n/ or as the last part of the glide on that vowel, then it is lost.



For example:

| | |
|--|-------------------------------------|
| '*.zi²na¹ <nose> + -a² < 1st per.sg.> | '*.zi²na¹a² <my nose> |
| '*.zi²na¹ <nose> + -bi¹ < 3rd per. affectionate> | '*.zin²bi¹ <his, affectionate nose> |
| '*.zi²ni² <child> + -e¹ < 3rd per. respect> | '*.zi²ni²e¹ <his, respect child> |
| '*.zi²ni² <child> + -bi¹ < 3rd per. affec> | '*.zi²ni²bi¹ <his, affec. child> |
| 'da²na³ <sibling of opposite sex> + -e¹ < 3rd per. resp> | 'da²ne³e¹ <his, resp. sibling> |
| 'da²na³ <sib. of opp.sex> + -bi¹ < 3rd per., resp> | 'dan²bi¹ <his, affec sibling> |

(/a/ becomes /e/ preceding the morpheme -e¹ as described in section 8.3)

Another instance of tone stability is shown in environments where tone is not lost.

When a vowel is deleted, its tone is temporarily transferred to the preceding vowel, even though in some cases this results in three

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tones on a vowel, which is not permissible in WIZ. The tone is transferred back to the right by the rule described in section 8.11. In the following examples vowel deletion rules (see section 8.8 and 8.9), the /a/ insertion rule (see section 8.10) and the rule which changes high tone to high-falling before a second high tone (see section 8.1) apply on the underlying form.

| | |
|---------------------------|---|
| | 'me ¹² e ¹ <swing> + -a ¹ <not here> |
| High tone rule 8.1 | 'me ¹² e ¹² a ¹ |
| Vowel deletion rule 8.9 | 'me ¹² i ² a ¹ |
| Vowel insertion rule 8.10 | 'me ¹² i ² aa ¹ |
| Tone transfer 8.11 | 'me ¹² a ¹² a ¹ <swing, not here> |
| | 'be ²³ o ¹ <moon> + -a ¹ <not here> |
| High tone (8.1) | 'be ²³ o ¹² + -a ¹ |
| Vowel deletion (8.8) | 'be ²³ i ² + -a ¹ |
| Vowel insertion (8.10) | 'be ²³ i ² a + -a ¹ |
| Tone transfer (8.11) | 'be ²³ a ¹² + -a ¹ |
| | 'be ²³ a ¹² a ¹ <moon, not here> |

If the transferred tone is the same as the preceding tone, or if it is the same as the last part of the glide of the preceding tone, then it is lost.

| | |
|-------------------------|--|
| | '*zo ²³ o ³ <river> + -a ¹ <not here> |
| Vowel deletion rule 8.8 | '*zo ²³ a ¹ |
| Loss of same tone | '*zo ²³ a ¹ <river, not here> |

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8.3 Vowel assimilation

| | |
|---|---------|
| T | T |
| a | e / + e |

Preceding the third person singular respect morpheme $-e^1$ the vowel /a/ becomes /e/. The tone of /a/ is retained. When /a/ occurs with high tone, the high tone drops to mid before the high tone of the syllable $-e^1$ except when the resulting tone combination would necessitate another syllable /e/ being added to carry the new tone as described in section 8.1.

| | |
|---|---|
| 'na ² ga ² <ear> + $-e^1$ <3rd per.resp> | 'na ² ge ² e ¹ <his, resp. ear> |
| 'lu ² za ¹ <tongue> + $-e^1$ <3rd per.resp> | 'lu ² ze ¹ e ¹ <his, resp. tongue> |
| 'na ² <hand> + $-e^1$ <3rd per.resp> | 'ne ² e ¹ <his resp. hand> |

Preceding any other morpheme beginning with /e/ other than the third person singular respect morpheme the vowel /a/ becomes /e/ only when it occurs in an unstressed syllable. The tone of /a/ is retained and the morpheme-initial /e/ takes on the tone of the /a/. When /a/ occurs in the stressed syllable in the same environment it is shortened and the /a/ and /e/ together have the length of a vowel cluster in a stressed syllable. For example:

| | |
|--|---|
| '*cu ² pa ¹ <two> + $-e^2$ rua ² <twenty> | '*cu ² pe ¹ e ¹ rua ² <twenty-two> |
| 'xa ² ['xa:ʔ] <nine> + $-e^2$ rua ² <twenty> | 'xa ² e ² rua ² ['xaeru [^]] <twenty-nine> |

That /a/ becomes /e/ rather than that /a/ is lost is indicated by the following examples:

a.) Similar tone patterns occur when the morpheme -e is affixed to a vowel other than /a/.

| | | | | |
|-----------------------------------|---------------------|--|--|---------------|
| 'be ² tsi ² | <brother of a male> | | 'be ² tsi ² e ¹ | <his brother> |
| 'na ² ga ² | <ear> | | 'na ² ge ² e ¹ | <his ear> |

b.) The reverse also occurs. /e/ becomes /a/ in certain environments before the morpheme -a² <not here> as described in section 8.7.

c.) Final /a/ in 'CVna words in which the final vowel is manifested on the surface only when followed by a vowel person marker (as described in section 8.5) becomes /e/ when followed by the 3rd person respect morpheme -e¹. It retains its tone however. Thus a word-final /a/ high tone coming together across syllable boundaries with /e/ high tone results in the tone pattern described in section 8.1.

| | | | | | | | |
|------------------------------------|--------|---|-----------------|------------------|--|---|---------------------|
| '.*zi ² na ¹ | <nose> | + | -a ² | <1st,pers.sg.> | | '.*zi ² na ¹ a ² | <my nose> |
| '.*zi ² na ¹ | <nose> | + | -e ¹ | <3rd pers.resp.> | | '.*zi ² ne ¹ e ¹ | <his, resp.nose> |

(See section 8.7.1 for a description of the perturbation occurring in the stressed stem of these two examples)

| | | | | | | | |
|-----------------------------------|----------------------|---|-----------------|----------------|--|--|---------------------------|
| '-da ² na ² | <sibl.of opp.sex> | + | -a ² | <1st,pers.sg.> | | '-da ² na ² a ² | <his sibl .of opp.sex> |
|-----------------------------------|----------------------|---|-----------------|----------------|--|--|---------------------------|

(The first person morpheme -a² perturbing to low tone is described in section 8.7.3)

| | | | | | | | |
|-----------------------------------|--------------------------|---|-----------------|-----------------------|--|--|------------------------|
| '-da ² na ² | <sibling of opp. sex> | + | -e ¹ | < 3rd pers. resp.> | | '-da ² ne ² e ¹ | <his resp. sibling> |
|-----------------------------------|--------------------------|---|-----------------|-----------------------|--|--|------------------------|

d.) /a/ also becomes /e/ preceding /ni/ in verb stems.

This is related to verb classes and is further described in the paper on WIZ verbs.

8.4 Vowel and consonant metathesis.

ni in / V + C
[- front]

In some 'CVnV words the final vowel and /n/ metathesize when preceded by a non-front vowel and followed by a person morpheme beginning with a consonant. The data supports only /i/ as the final vowel and this metathesis rule must apply before the vowel deletion rule described in Section 8.5.

| | | | |
|---|----------------------|--|-------------------------|
| li ² '.*zu ² ni ² | <nest> | li ² '.*zu ² in ² lu ² | <your nest> |
| ri ² 'du ² ni ² a ² | <I am hungry> | ri ² 'duin ² lu ² | <you are hungry> |
| e ² '*zo ² ni ² a ² | <I will repair> | e ² '*zoin ² lu ² | <you will repair> |
| *ri ² 'za ² ba ² di ² 'i ² | <I am <u>angry</u> > | *ri ² 'za ² bin ² lu ² | <you are <u>angry</u> > |

(Section 8.5.2 describes the vowel deletion which occurs before a high vowel.)

When the morpheme /a/ <not here> follows 'CVnV words and they are not followed by a person morpheme, the /a/ metathesizes with the /n/. It is interesting to note that the final vowel is lost as described in section 8.5 even though not followed by a person morpheme beginning with a consonant.

| | | | | | |
|------------------------------------|--------------------|-------------------|------------|-------------------------------------|---------------------------------|
| '-da ² na ² | <sibl. of the sex> | + -a ² | <not here> | '-da ² a ² n | <sibling of opp. sex, not here> |
| '.*zi ² ni ² | <child> | + -a ² | <not here> | '.*zi ² a ² n | <child, |

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not here>

.#zu²'ba³na³ <tail> + -a¹ <not here> .#zu²'ba³a¹n <tail,
not here>

As described in section 8.1 two high tones coming together across syllable boundaries causes the first high tone to become high-falling tone. When -a¹ <not here> is metathesized with /n/ and the high tone of -a¹ comes together with final high tone on the 'CVCV word, the first high tone becomes high-falling.

'.#zi²'na¹ <nose> + a¹ <not here> '.#zi²'na¹a¹ '.#zi²'a¹a¹n
<nose, not here>

'.#ze²'ni¹ <saliva> + a¹ <not here> '.#ze²'ni¹a¹ '.#ze²'a¹a¹n
<saliva, not here>

8.5 Vowel deletion

/i/ and /a/ are weak vowels when they occur in an unstressed syllable word-finally in that they can be lost in certain environments. (10)

8.5.1 Vowel deletion in 'CVnV words.

V O / n # # W
 |
 + C

Some 'CVCV words in which the consonant in the unstressed syllable is /n/ are manifested as the 'CVC pattern on the surface preceding a morpheme beginning with a consonant. Preceding a person morpheme beginning with a vowel and optionally across word boundaries the final vowel /i/ or /a/ is not lost.

'*zie¹'ni² <neck> + -e¹ <3rd pers.res> '*zie¹'ni²e¹ <his resp.>

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neck>

'*zie¹²ni² <neck> + -lu² <2nd pers> '*zien¹²lu² <your neck>

'.*zi²¹na¹ <nose> + -a² <1st pers> '.*zi²¹na¹a² <my nose>

'.*zi²¹na¹ <nose> + -tu³ <1st pers pl> '.*zin²¹tu³ <our-excl. nose>

'.*zi²¹na¹ <nose> 'be²-da³ <fox> '.*zin²¹ 'be²-da³ <fox's nose>

or

'.*zi²¹na¹ <nose> 'be²-da³ <fox> '.*zi²¹na¹ 'be²-da³ <fox's nose>

'kua²³na² <plant> + '*za²¹ <green> 'kuan²³'za²¹ <a type of plant>

'kua²³na² <plant> + '-di²na¹ <spring> 'kuan²³'-di²na¹ <a type of plant>

'na²na¹ + "to¹² + 'be²³o¹ 'nan²"do¹²'be²³o¹ <moon>
<mother> <augment> <month>

'na²na¹ + za²'be²li¹ 'nan² za²'be²li¹ <mother Isabel>
<mother> <Isabel>

Section 6.4 describes the deletion of the first vowel in <Isabel>. Note also that 'na²na¹ <mother> is of Aztec origin.

There are 'CVnV words which in the same environment do not lose the final vowel.

li²'.*zi²na² <shadow> + -lu² <2nd pers> li²'.*zi²na²lu² <your shadow>

*ri²'la²³na³ <rob> + -lu² <2nd pers> *ri²'la²³na³lu² <you are robbing>

8.5.2 Vowel deletion in polymorphemic words.

V O / + V

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[+high]

In polymorphemic words an unstressed vowel and its tone are lost preceding a morpheme beginning with a high vowel. When the second morpheme begins with a stressed vowel the stress moves back to include the final consonant of the first morpheme.

| | |
|---------------------------------------|-------------------------------|
| 'da²da¹ <father> + u²'bi²za² <heat> | 'da²du¹'bi²za² <sun> |
| 'i¹ca² <hair> + 'i¹ki² <head> | 'i¹'ci¹ki² <hair of the head> |
| 'ra²ka¹ <to be able> + 'i²*za² <rain> | 'ra²'ki¹*za² <it is raining> |
| 'li²zi² <house> + 'i²*za¹ <iron> | 'li²'i².*za¹ <prison> |

*re²'za² <to be tired> + -ba¹ <emph> ni³ 'i²' + -lu² <2nd pers> ✓
 *re²'za²bin¹lu² <you are tired>

(The vowel and consonant metathesis which takes place in the last example is described in Section 8.4)

There are several words in which the final consonant of the first morpheme, after the vowel has been deleted, is part of a consonant cluster. In these words, the stress on the first morpheme is deleted.

| | |
|---|----------------------------|
| 'in²-da² <water> + 'i²*za² <rain> | in²'-di²*za² <rain water> |
| 'in²-da² <water> + 'i²³na³ <chile pepper> | in²'-di²³na³ <chile sauce> |

8.5.3 Unstressed syllable deletion.

There are two words related to the plant world which, when they occur as the first stem of a compound, lose the final unstressed

syllable. In both cases the syllable consists of the consonant /g/ and the vowel /a/.

| | | | |
|--|---|--|--|
| '*za ² ga ² <tree> | + | '-di ² na ² <palm> | '*za ² '-di ² na ² <a type of tree> |
| '*za ² ga ² <tree> | + | bi.*z ² 'ka ² li ² <church official> | '*za ² bi.*z ² 'ka ² li ² <a type of tree> |
| 'la ² ga ² <leaf> | + | 'de ² -Ou ² <squash> | 'la ² 'de ² -Ou ² <leaf of squash plant> |

8.6 Interrupted vowel.

u[?]e ue[?] / + a

The lenis glottal closure in the interrupted vowel cluster /u[?]e/ metathesizes with /e/ when the vowel cluster is followed by the morpheme /a/ so that /e/ is interrupted instead of /u/. As described in section 2.1, an interrupted vowel cluster is realized phonetically as being lightly echoed following the lenis glottal closure. Together both interrupted and plain vowel are equal to the length of a plain vowel cluster. Thus, /u/ and /e/ are both very short phonetically.

If a velar consonant precedes the interrupted vowel cluster, then /u/ is phonetically realized as labialization, and the /e/ is more distinct although it may phonetically be realized as [e] because of its contact with /a/. If a non-velar consonant precedes the interrupted vowel cluster, the /u/ is more distinct and /e/ is rarely audible, except that it can be recognized by its phonetic realization [e] preceding the glottal closure as it begins to take on the sound of the following /a/.

'ku?e²³ <back> + -a² <1st per.sg.>

'kue?¹a² <my back>

'du?e²³ <intesting> + -a¹ <not here>

'due?²a¹ <intestine,
not here>

(see section 8.7.3 for description of tone perturbation occurring on the stem.)

8.7 First person singular perturbation.

In general, the first person singular morpheme -a² regressively perturbs noun stems to a mid-high tone pattern. There are many more tone patterns for verb stems with first person singular '<sup>1?>' and the exceptions to the mid-high tone pattern listed below in the remainder of Section 8.7 fall neatly into these patterns. ✓

8.7.1 Perturbation maintaining basic mid high tone pattern.

S S² / ' S + a²

and

S S¹ / 'S² + a²

The stressed syllable is perturbed (or remains) mid (tone 2) and the unstressed final syllable is perturbed to (or remains) high (tone 1) when followed by the first person singular morpheme -a². Stems which have a mid high pattern in the basic form do not change. No noun stems ending in an unstressed low tone have been found to perturb in this fashion but the data supports verbs perturbing in this environment.

'na²ga²

+ -a²

'na²ga¹a² <my ear>

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| | | |
|-----------------------------------|-------------------|--|
| 'i ¹ ki ² | + -a ² | 'i ² ki ¹ a ² <my head> |
| 'la ¹ di ² | + -a ² | 'la ² di ¹ a ² <my town job> |
| 'lu ² za ¹ | + -a ² | 'lu ² za ¹ a ² <my tongue> |
| '*ra ² pi ³ | + -a ² | '*ra ² pi ¹ a ² <I am climbing> |

The two rules above are related to the following rule which changes the tone of the stressed syllable of the stem to the basic mid high tone pattern found on words followed by the first person singular morpheme.

$$V \quad V^{21} / \quad ' \quad CV^3 + a^2$$

where C is lenis

When stem final unstressed syllable is low (tone 3), including the inserted /*za³/ described in section 8.7.4, the first person morpheme -a² regressively perturbs stems to mid-rising (tone 21). The unstressed final syllable remains low.

| | | |
|--|---------------------------------|---|
| '-da ² na ³ <sibl. of opp.sex> | + -a ² <1st per sg.> | '-da ² na ³ a ² <my sibl. of opp.sex> |
| 'lo ¹ zēa ¹ <forehead> | + -a ² <1st per.sg.> | 'lo ¹ zēa ² *za ³ a ² <my forehead> |

(See section 8.7.4 for a description of the rule inserting /*za³/ and the resulting perturbation of the first person morpheme -a².)

$$V \quad V^1 / \quad ' \quad CV^3 + a^2$$

where C is fortis

If, however, the final unstressed syllable with low tone (tone 3) begins with a fortis consonant, then the preceding stressed

syllable is perturbed to high (tone 1) rather than to mid-high rising (tone 21).

'.*zi²ki² <shoulder> + a² <1st pers. sing.> '.*zi¹ki²a² <my shoulder>

8.7.2 Stressed stem final perturbation.

If the stem-final syllable is stressed and open with a plain vowel or an interrupted vowel, both regressive and progressive perturbation occur.

$$\begin{array}{ccc} V & & V^2 \\ & & V^2 / ' + a^2 \\ V? & & \\ \text{then} & & \\ a^2 & & a^{12} / 'V \end{array}$$

The first person singular morpheme -a² regressively perturbs the stressed syllable to mid (tone 2). Then the stressed syllable progressively perturbs the tone of -a² to high-mid falling (tone 12). In this way, the word retains the typical mid high pattern.

'lo¹² <face> + -a² <1st pers> 'lo²a¹² <my face>
 .*zi²'-Do¹² <grandchild> + -a² <1st pers> .*zi²'-Do²a¹² <my grandchild>
 'ro?¹² <mouth> + -a² <1st pers> 'ro?²a¹² <my mouth>

8.7.3 Interrupted mid-low falling vowel perturbation.

$$CV?(V)^2 \quad CV?(V)^1 / + a$$

1st person singular

The tone of CV?(V)²³ perturbs to high tone preceding -a². There are two examples of an interrupted vowel cluster, both of which have /u?e/ in the basic form. Preceding -a², the glottal stop moves to the right, interrupting /e/ instead of /u/. The phonetic changes which occur when the morpheme -a follows the interrupted vowel cluster /u?e/ are described in section 8.6.

'le?²³ <stomach> + a² <1st pers sg> 'le?¹a² <my stomach>
 'du?e²³ <intestine> + a² <1st pers sg> 'due?¹a² <my intestine>

8.7.4 Syllable insertion.

0 *za³ / 'Ca + a²

Stems that end in stressed /a/ insert an extra syllable with low tone /*za³/ between the stem and -a².

'na²¹ <hand> + a² <1st pers sg> 'na²¹*za³a² <my hand>
 'lo¹² '.*zea¹² <forehead> + a² <1st pers sg> 'lo¹² '.*zea²¹*za³a² <my forehead>
 'ni?a² <foot> + a² <1st pers sg> 'ni?a²¹*za³a² <my foot>

Both regressive and progressive perturbation take place in first person singular forms when the stem-final unstressed syllable is low (tone 3), including the inserted /*za³/ as a final unstressed syllable. The regressive perturbation which takes place when the stem-final unstressed syllable is low tone has already been described in section 8.7.1. When low tone (tone 3) has perturbed the stem tone, then the low tone (tone 3) of the unstressed syllable pro-

gressively perturbs the mid tone (tone 2) of the first person morpheme -a to low tone (tone 3). (20) ✓

8.7.5 There are a few words which do not follow the above described mid high perturbation pattern, but have a special high mid perturbed pattern. It may be coincidental that the three words begin with /.*z/, have non-low level tones on the stressed underlying stem syllable and non-high tone on the final unstressed syllable whose nucleus is an /i/. In words of this type the high mid pattern occurs on the stressed syllable if it is followed by a lenis consonant. If the stressed syllable is followed by a fortis consonant, only high tone occurs on the stressed syllable and mid occurs on the unstressed syllable following. If the stem consists of three syllables then the tone pattern occurs across the entire stem, with the first syllable being perturbed to high and the following two syllables being mid.

| | | |
|---|---------------------------------|--|
| '.*ziu ² zi ² <son- | + -a ² <1st pers sg> | |
| '.*ziu ¹ zi ² a ³ <my son- | | in-law> |
| '.*zi ¹ ci ² <elbow> | + -a ² <1st pers sg> | '.*zi ¹ ci ² a ² <my elbow> |
| .*zo ³ 'li ² zi ² <daughter- | + -a ² <1st pers sg> | .*zo ¹ 'li ² zi ² a ² <my daughter-in-law> |

(The above examples fall neatly into the tone patterns established for verb stems with first person singular. See footnote 19.)

The fact that -a² perturbs unstressed stem-initial syllables which begin with /.*z/ to high tone (1) is also seen in the following example, although the rest of the stem perturbs according to the

mid high pattern.

.#zu²'ba³na³ <tail> + -a² <1st pers sg> .#zu¹'ba²na³a³ <my tail>

8.8 Vowel deletion.

V O / V V

where V is any vowel, except /e/
where V is any vowel except /u/ if it
is preceded by a velar consonant

To limit the number of similar vowels occurring together, any vowel, except /e/, is deleted between two vowels when the first vowel is not /u/ preceded by a velar consonant in a stressed syllable.

'be²³e¹ <nit> + -a¹ <not here>

high vowel (8.1) 'be²³e¹² + a¹

vowel deletion (8.9) 'be²³i² + a¹

vowel insertion (8.10) 'be²³i²a + a¹

tone transfer (8.11) 'be²³a¹² + a¹

'be²³a¹²a¹ <nit, not here>

'na²ga² <hand> + -a² <1st pers sg> + -a¹ <not here>

Mid high tone maintenance (8.7.1) 'na²ga¹ + a² + a¹

Vowel deletion (8.8) 'na²ga¹ + a¹

High tone (8.1) 'na²ga¹² + a¹

'na²ga¹²a¹ <my hand, not here>

When the first vowel is /u/ preceded by a velar consonant in an unstressed syllable the above vowel deletion rules optionally

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x7

applies.

'baʔ²¹gua¹ <mask> + -a¹ <not here>
Vowel deletion (8.8) 'baʔ²¹gu¹ + a¹
High tone (8.1) 'baʔ²¹gu¹² + a¹
'baʔ²¹gu¹²a¹ <mask not here>
OR
'baʔ²¹gua¹ + a¹
High tone (8.1) 'baʔ²¹gua¹² + a¹
'baʔ²¹gua¹²a¹ <mask, not here>

8.9 Vowel deletion.

e(?)
 (+a)
'i
e 0 /
 u(?) e

/e/ is deleted between certain vowels to limit the number of similar vowels occurring together. /e/ is deleted following another /e/ plain or interrupted, and preceding a vocalic morpheme /a/. (Following stressed /i/ which is not interrupted and preceding the morpheme /a/, /e/ is deleted.) Following /u/, plain or interrupted and preceding another /e/, /e/ is deleted.

'leʔ²³ <stomach> + -e¹ <3rd pers, resp> + -a¹ <not here>
'leʔ² + -e¹ + -a¹
Vowel deletion (8.9) 'leʔ²¹ + -a¹
Vowel insertion (8.10) 'leʔ²a¹ + a¹
High tone (8.1) 'leʔ² + a¹² + a¹

'le?²a¹²a¹ <his-respect stomach, not here>

'du?e²³ <intestine> + -e¹ <3rd person respect>

Vowel deletion (8.9) 'du?²³ + e¹

'du?²³e¹ <his-respect intestine>

'bi¹²e¹ <3rd sg. respect, affectionate> + -a¹ <not here>

Vowel deletion (8.9) 'bi¹²¹ + -a¹

Vowel insertion (8.10) 'bi¹²a¹ + -a¹

High tone (8.1) 'bi¹²a¹² + a¹

'bi¹²a¹²a¹ <he-respect, affectionate, not here>

8.10 Vowel insertion.

T

0 a / V(?) + a¹

where T is any tone glide of at least three tones

/a/ is inserted to carry an impermissible tone on a preceding vowel. When the preceding tone is any glide of at least three tones /a/ is inserted before a high tone. This vowel insertion rule is ordered to occur after high tone (tone 1) becomes high-mid falling (tone 12) preceding high tone (tone 1) across morpheme boundary (See section 8.1).

'be²³o¹ <moon> + -a¹ <not here>
 High tone (8.2) 'be²³o¹² + a¹
 Vowel deletion (8.8) 'be²³i² + a¹
 Vowel insertion (8.10) 'be²³i²a + a¹
 Tone transfer (8.11) 'be²³a¹² + a¹
 'be²³a¹²a¹ <moon, not here>

e¹'gua¹² <to plough> + -ru² <more> + -lu² <2nd pers>
 High tone (8.2) e¹'gua¹²i + ru² + lu²
 Vowel insertion (8.10) e¹'gua¹²ia + ru² + lu²
 Tone transfer (8.11) e¹'gua¹²a¹ + ru² + lu²
 e¹'gua¹²a¹ru²lu² <you will plough more>

za²ge²'o¹² <coyote> + -a¹ <not here>
 Vowel deletion (8.8) za²ge²i² + a¹
 Vowel insertion (8.10) za²ge²ia + a¹
 Tone transfer (8.11) za²ge²a¹² + a¹
 za²ge²'a¹²a¹ <coyote, not here>

It has not yet been determined what happens to stress when a stressed vowel is deleted since this is the only example in the data in which this occurs.

8.11 Tone transfer.

The tone of a vowel which was temporarily transferred to a preceding vowel when that vowel was deleted or because of perturbation is transferred back to /a/ which was inserted preceding -a¹. The final high tone or high-falling tone is transferred to /a/ preceding -a¹.

| | |
|------------------------|--|
| | be ² 're ³ a ¹ <ant> + -a ¹ <not here> |
| High tone (8.1) | be ² 're ³ a ¹ 2 + a ¹ |
| Vowel insertion (8.10) | be ² 're ³ a ¹ 2a + a ¹ |
| Tone transfer (8.11) | be ² 're ³ a ¹ 2 + a ¹ |
| | be ² 're ³ a ¹ 2a ¹ <ant, not here> |

8.12 Vowel cluster formation.

| | | | |
|---|---|---|--------------------|
| T | T | T | |
| u | . | v | / g a ¹ |

/u/ and another vowel coming together across a syllable boundary become a vowel cluster following /g/ and preceding the morpheme -a¹. The tone on the vowel following /u/ is lost when the two vowels become a cluster.

'gu²3e³ <scratch> + -a¹ <not here> 'gue²3a¹ <scratch, not here>

FOOTNOTES

1. Data for this study were elicited during several field trips to the municipal town of Santa Ana Yareni located in the WIZ dialect area from October, 1979 to August, 1980: from May, 1981 to December, 1982: during a three month linguistic workshop in Mitla, Oaxaca, Mexico in the spring of 1983: and during July and August, 1986 in Catalina, Arizona. Principal WIZ speakers who contributed to this study were Maria Ram/ires Ruiz, 29 years, Felix Cruz Ruiz, 35 years and Odil/on Ch/avez Hern/andez, 26 years. This study was done under the auspices of the Summer Institute of Linguistics.

2. There is precedence for these voiceless-voiced symbols for the fortis-lenis contrast (Jones, p. 163 and Lyman, p. 137) even though the fortis-lenis contrast in WIZ is not based on voicing but on length, as in the dental obstruents /t:/ and /t/ which will be symbolized as /t/ and /d/ in this paper, the alveopalatal affricates /*c:/ and /*c/ which will be symbolized as /*c/ and /*j/ and the alveolar and retroflexed alveopalatal fricatives /s:/ - /s/ and /.*s:/ - /.*s/ which will be symbolized as /s/ - /z/ and /.*s/ - /.*z/ respectively.

3. Throughout this paper phonemic tones will be written on phonemic representations of words, indicated by numbers which follow the syllable with which they are associated, but phonetic tones will not be marked in the phonetic data.

4. The alveopalatal lenis affricate is found in only the following four WIZ words and two of these are Spanish loans:

| | |
|-------------------------------------|----------------------|
| 'pi ¹² *ju ² | <pigeon> (Spn. loan) |
| '*cu ² *ju ² | <hard tortilla> |
| '*cu ² *ju ² | <Jesus> (Spn. loan) |
| 'cue ¹² *ju ² | <deaf> |

5. The fortis alveolar fricative is found in only four WIZ words, two of which are Spanish loans:

| | |
|---|-----------------------------|
| 'se ¹ ra ² | < candle > (Spn. loan) |
| re ² 'so ¹ na ² | < message > |
| 'i ² sa ³ "do ¹² | < corn tassel > |
| 'du ¹ sa ² | < prairie dog > (Spn. loan) |

6. The fortis alveopalatal fricative occurs most frequently following a high front vowel. For example:

| | | |
|----------------------------------|---------------|-------------------|
| 'i ² *sa ³ | ['i*z:ˆ] | < flower > |
| 'be*sa+lu | ['-b&*z:ˆ"lu] | < you went home > |

Its lenis counterpart has not been found to occur in this environment. Only one WIZ word has been found in which the fortis alveopalatal fricative occurs in contrast with its lenis counterpart and this occurs following a low mid vowel.

| | | | |
|--------------------|------------------------------------|-------------|-------------------------|
| 'ro? ¹² | '*sa ² *sa ² | ['*z:a*z:ˆ] | < one who talks a lot > |
|--------------------|------------------------------------|-------------|-------------------------|

7. . indicates syllable break.

8. + equals morpheme break.

9. Sometimes /u/ in stressed syllable preceding fortis consonant fluctuates in the degree to which it labializes the preceding

velar consonant. The vowel following /u/ is longer than a vowel preceding fortis consonant but shorter than a vowel preceding lenis consonant. For example:

ru²'gue³la³lu² <you are permitting>

[*ru+'-guel:ˆ+"lu] [*ru+'-guel:ˆ"lu]

This variation may be accounted for in that both /u/ and /l/ can carry tone.

10. Following high front vowel and across a morpheme boundary, /z/ in stressed verb stem initial position may be optionally deleted. This occurs especially in fast speech. For example:

re²+'*zo¹ku² 'reo¹ku² <dressing again>

ri²+'*za²*za¹ 'ria²*za¹ <hitting again>

11. The down drifting of tones in WIZ is brought about in a number of ways:

Mid tone following high or low tone (high or low tone may be the second tone of a rising or falling tone) is lower than the mid tone preceding high or low tone by about half a step. All mid tones following mid tone with no intervening high or low tone are at the same level as the first mid tone.

ri²'bi²si² 'ta²pa² ca² '*za²ga² 'ci²ci²

<four hard trees are withering>

ri²'bi²si² 'ga³*zu³ ca² '*za²ga³ 'ci²ci²

<five hard trees are withering>

ri²'bi²si² 'cu²na¹ ca² ca² be²'ru²di²'*za²ti²

<three dead turkeys are withering>

Word final stressed high tone followed by stressed high tone are at the same level. However, stressed high following unstressed high word final or mid-high rising, which are both slightly lower than stressed high, is at the same level as this unstressed high resulting in a down drifting of high tones. For example:

'cu²na¹ ca² 'ne²ru¹ '*za¹ci¹ <three yellowish sheep>

Stressed word initial low tone when following low tone is always lower than this preceding low tone because word final low tone is raised by lenis glottal closure. For example:

ri²'gi²si³lu² <you are washing quickly.>

ca² 'du²bi³ '*za³.*su³ <five old feathers>

12. Low tone in an unstressed syllable in word final position is a mid-low allotone. In a flow of speech lenis glottal closure is lost and no longer serves as a means to distinguish low tone. Mid tone downsteps across word boundaries when interrupted by non-mid tone. Thus, in an unstressed syllable word finally, but not preceding pause and following high or low tone, low tone and mid tone neutralize. In this environment a tone between low and mid occurs

13. Words spoken at normal speed were timed with a stop watch on

the slowest speed of a portable tape recorder. As can be seen below, there is from 7 hundredth to more than a tenth of a second difference between the stressed syllable CV and 'CVV which is here being interpreted as 2 syllables.

| | | | tenth of a second |
|-------|-----------------------------------|-----------------------|-------------------|
| 'CVV | 'me ¹² e ¹ | <swing> | 6.0 |
| 'CVCV | 'ze ¹ la ² | <mixture> | 5.3 |
| 'CVV | 'bi ²³ a ¹ | <prickly pear cactus> | 7.7 |
| 'CV | be ² 're ³¹ | <ant> | 6.7 |
| 'CVV | 'be ²³ o ¹ | <moon, month> | 7.7 |
| 'CV | las ² 'do ³ | <liver> | 6.5 |

14. See section 8.1 for discussion of high tone becoming high-falling when followed by high tone across a morpheme boundary.

15. Larry Clark in an article entitled "Linguistic Acculturation in Sayula Popoluca" suggests that phonological changes occurring in loan words vary according to the period during which they were borrowed.

16. The clitic ru² "more" and the clitic ti² "please" regressively perturbs the preceding tone to high. High tone or a glide ending in high tone remain high. A tone in a stressed syllable is retained and a high tone is added. (See section 8.10 for the vowel insertion rule.)

17. There are two classes of CVnV stems. The larger class forms first person singular by suffixing /a/ to the stem. The

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second class is made up of verb stems which are subject oriented and which refer to ones will, perception or emotions. These verbs form first person singular by dropping the stem final /ni/ and suffixing /di/. Verbal clitics like ba¹ "emphasis" are affixed to the verb stem preceding -di³ "first person singular" or /ni/ when the other person markers occur.

Where is (18) in the text.

18. Positing a and i as the underlying forms of 'CVnV words helps to account for the length occurring on the vowel morphemes a and e when affixed to these words. If a and i did not occur in the underlying form of these words, a vowel would need to be inserted before the vowel person morphemes to account for the length and there are no phonological clues to indicate whether an /a/ or an /i/ should be inserted. One would need to posit classes. The tone of the inserted vowel would need to be accounted for as well, perhaps by word final n carrying tone. The following rule could be posited.

| | | | |
|---------------------------------------|--------|--|--------------------------------------|
| O | V / Vn | + V | |
| '.*zin ²¹ + a ² | | '.*zin ² + a ¹ + a ² | <my nose> |
| 'dan ²³ + e ¹ | | 'dan ² + e ³ + e ¹ | <his sibling of the opposite sex> |
| '*zien ¹² + e ¹ | | '*zien ²³ + i ² + e ¹ | <his neck> |

19. Verbs fall into four different classes according to the way they are perturbed by first person:

Class 1

The tone on the verb is retained and does not perturb even though followed by the first person singular.

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*ri²'ko² + -a² *ri²'ko²a² <I am finishing a meal>

*ri²'ni¹ti² + -a² *ri²'ni¹ti²a² <I am making a mistake>

*ra²'na¹la¹ + -a² *ra²'na¹la¹a² <I am following>

Verbs whose stems do not perturb are often but not always the counterparts of causative verbs.

Several of the inalienable possessed nouns which do not follow the rules posited for first person singular perturbation for nouns retain their basic stem tones.

tsii² + -a² tsii²a² <my voice>

'zi¹ci² + -a² 'zi¹ci²a² <my elbow>

i.z²'di³ + -a² i.z²'di³a² <my breakfast>

'zi²-da³ + -a² 'zi²-da³a² ('²) <my cowlick>

Class 2

The tone of the stressed syllable of the verb stem perturbs to high or remains high. When the tone of the stressed syllable is low-high risin[✓] (tone 31) only the first part of the glide perturbs to high. The high remains and a high-mid falling high pattern occurs as described in Section 8.1. The unstressed tone of the stem is not perturbed when it is non-high. High tone in unstressed syllable becomes mid.

*ru²'de² + -a² *ru²'de¹a² <I will burn something>

*ru²'ga¹zi² + -a² *ru²'ga¹zi²a¹ <I will nurse>

*ru²'ku³la³ + -a² *ru²'ku¹la³ <I will whip>

Verbs which perturb in this way are often causative.

Several inalienably possessed nouns fall into this tone pattern

'le?²³ + -a² 'le?¹a³ <my stomach>

'zi²ki³ + -a² 'zi¹ki³a³ <my elbow>

As mentioned in Section 8.7.2, when the unstressed syllable with low tone begins with a fortis consonant, then the preceding stressed syllable is perturbed to high. Including the verbs, however, this perturbation also occurs before lenis consonants.

Class 3

There are some verb stems which are perturbed to high-mid falling (tone 12) in the stressed syllable of the stem. The unstressed syllable becomes low or remains low. Following unstressed low /a/ perturbs progressively to low tone.

*ru²'ge²³ + -a² *ru²'ge¹²a³ <I am transporting>

*ri²'na³ba³ + -a² *ri²'na¹²ba³a³ <I am asking>

'ziu²zi² + -a² 'ziu¹²zi³a³ <my brother-in-law>

*ru²'ca?²¹ + -*za³ *ru²'ca?¹²*za³ <I am heating>

The inalienable possessed noun /'ziusi/ falls into this category.

'ziu²zi² + -a² 'ziu¹²zi³a³ <my son-in-law>

Class 4

The verbs in this class perturb as described in Section 8.7 to a basic mid high pattern. The verbs occurring in this class are one which form the potential aspect with a consonant or with /e/. There are some verbs in this class where the stressed mid tone may optionally be high tone.

'*ra²-da² + -a² '*ra²-da¹a² <I am planting>

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or

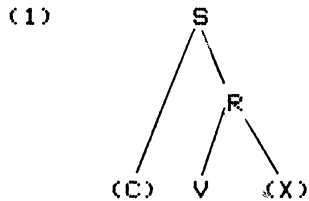
'*ra¹-da¹a²

20. A consonant insertion and vowel lengthening rule would be an alternative solution to the syllable insertion rule. *z would be inserted in the environment described by the syllable insertion rule.

Following *z the first person singular morpheme is lengthened.

The Syllable

The syllable in WIZ is described by the following syllable template. There is one position outside the rime (R).



The syllable is the Tone bearing unit in WIZ. Therefore exactly one tone is assigned to every syllable, regardless of the number of vowel positions in it. This is important evidence for syllable divisions proposed below.

Onsets

Syllables containing onsets are more common than those without. The onset of a syllable may generally consist of any consonant in the language and also the semivowels /y/ and /w/.¹

Q 1: When you say "the semivowel /y/", you are referring to 1) stressed syllables having /ž/ as the onset and / e/ as the vowel in the rime and followed by a syllable in which the onset consists of a lenis consonant?

'žiezi 'town'
'žieda 'flour'

2) the four words or so in which a branching rime consisting of the vowel / i/ in the first vowel position and a different vowel in the second position is found in an unstressed syllable?

'čenya '19'
'galya '20'
'belyu 'money'
'xuizya 'much'

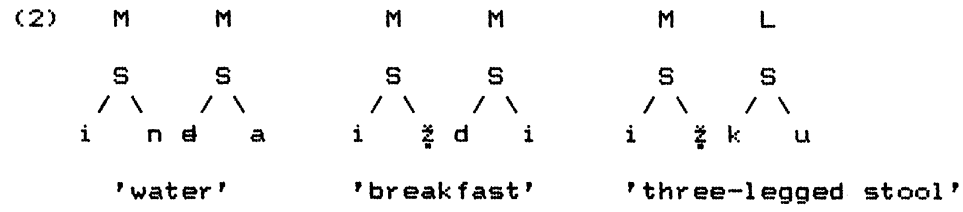
Q 2: Wouldn't we have to include the semivowel /w/ in order for the statement immediately preceding example (4) to be true?

In unstressed syllables and in stressed syllables followed by a fortis consonant onset, velar stops are labialized when followed by a vowel cluster in which the first vowel is / u/.

gwe'tsa 'above'
'ba?gwa 'mask'
'g^wini 'a type of insect'

'kwita rib

A syllable with no onset must occur either word-initially or following a plain (never glottalized) vowel. ^{yes}



Rimes

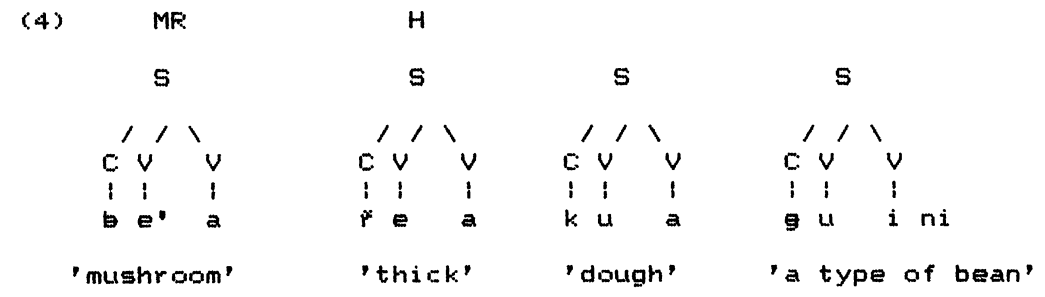
Simple Rimes

Any vowel may occur in a simple rime (that is, without the optional part of the rime).

Branching Rimes

A branching rime may consist of two vowels or a vowel and a consonant, as indicated by the syllable template.

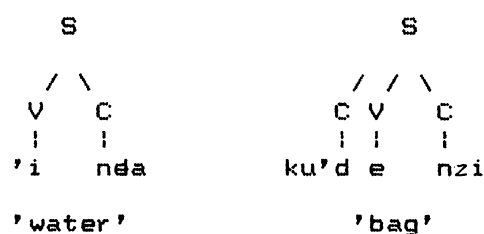
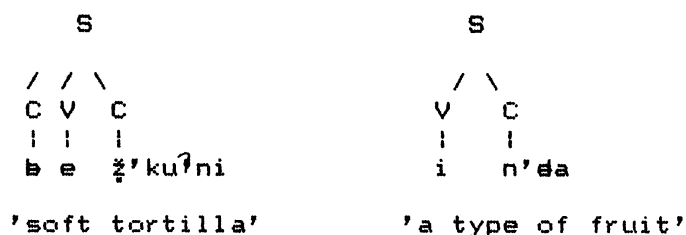
Branching rimes consisting of two vowels occur only in stressed syllables.



Q 3: Am I correct in assuming the velar consonants in the last two examples are not labialized since the / u/ receives the same time value as the vowel following it?

Branching rimes consisting of a vowel and a consonant occur both in stressed and unstressed syllables. (2)

(5)



There are some constraints on vowel sequences in WIZ, apart from a general prohibition on identical vowel qualities appearing twice in the same syllable. First, the vowels / a/ and / o/ are not permitted as the first vowel of a cluster. Only / i/, / e/, and / u/ occur in this position.

(6) * V V
 |
 [+back]
 [-high]

Second, when the first vowel is / e/, the second vowel must be / a/ or / o/.

(7) If V V
 | |
 [- high] |
 [- back] |
 -----|-----
 Then [-high]
 [+back]

Glottalized vowels occur only in the first rime position of stressed syllables and are never followed by a consonant in the rime.

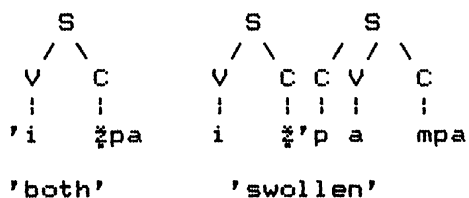
(8) * V V]
 |
 [+c. g.]

(9) * V C]
 |
 [+c. g.]

Rimes with Consonants

The rime may also end in a consonant.
 Morpheme-internally, if it is a consonant, it must be /n/, /ʒ/ or /m/.

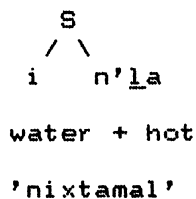
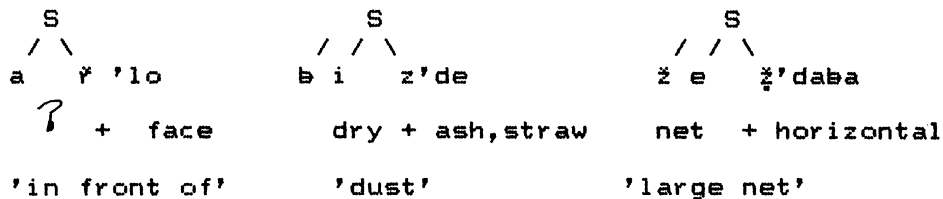
(10)



See also the examples in (2).

In polymorphemic words, if the rime ends in a consonant, it may be /ʃ/, /z/, /ʒ/ or /n/.

(11)



When the rime contains a consonant, the rime of course has only one vowel position, but never / o/. (3)

Morpheme-internally, the only vowel which may occur in a word-initial rime containing a consonant is / i/.

- (12) If V C]
 |
 -----|-----
 Then [+ high]
 [- back]

In polymorphemic words, / a/, / e/ and / u/ may also occur in this position. See examples in (11).

1 There is a morpheme structure constraint such that an onset following an interrupted vowel must be /n/, /ž/ or /g/, as shown below.

| | |
|---------------|----------|
| 'že'žna² | 'plate' |
| 'be'žza² | 'knot' |
| 'be'žzu² | 'flea' |
| 'ye'žni¹ | 'tender' |
| 'ba'žgwa¹ | 'mask' |
| 'be'žza'žgwa² | 'frog' |

~~This constraint is suspiciously similar to the constraint on rime-final consonants, but the connection is not clear.~~

Rime-final consonants are /ž/ ([ʒ]), not /ž/, /n/ and I've found one word in which /m/ occurs in this position.

iž'pampa 'swollen'

2 I don't think 'žyen 'neck' belongs here. It is a CVni word described in Section 8.5 of the original paper - the vowels / a/ and / i/ following /n/ in unstressed word-final position occur on the surface only when followed by a person marker which begins with a vowel. All words ending with /n/ are inalienably possessed nouns and verbs of this kind.

| | | | |
|------------|----------------------------------|------------|------------------------------------|
| žyeni + a | 'my neck' | žyen + lu | 'your (sg.) neck' |
| dana + a | 'my sibling of the opposite sex' | dan + lu | 'your sibling of the opposite sex' |
| ribeni + a | 'I'm working' | riben + lu | 'you're working' |

3 I think we can eliminate 'tsuin because of the following:

Verbs which are 'CVni in the underlying form occur on the surface preceding person markers beginning with vowels.

| | |
|------------|------------------------------|
| režoni + a | 'I repair' |
| riduni + e | 'he/she (respect) is hungry' |

ni → in / V + C
 |
 [+back]

režoin + lu 'you are repairing'
 riduin + lu 'you are hungry'

'tsuin is not really a noun but some kind of a quasi verb. It comes from the following verb:

| Pot. | Comp. | Hab. | Dubit. | |
|--------|---------|---------|---------|--------------------|
| izuni | bizuni | rizuni | gwazuni | 'to drip' |
| utsuni | betsuni | rutsuni | gutsuni | 'to cause to drip' |

By applying the above rule to the causative of the verb 'to drip' and dropping the aspect marker and the theme vowel, one comes up with 'tsuin. The only sentence in which I have heard this word is:

tsuin tsuin ba raca 'It is dripping'

Compare: raca iža 'It is raining.'

Distributional restrictions referring to lenis and fortis consonants:

The distinguishing feature between lenis and fortis consonants in WIZ is length. It is not surprising then that many of the changes noted below are adjustments in length. Most of the changes occur in the syllable preceding fortis consonant and are usually a shortening of the vowel occurring in this syllable to accommodate the longer fortis consonant which follows.

Is it significant that lenis and fortis consonants seem to affect only the syllable that precedes them?

1. Vowels are short in stressed syllables preceding fortis consonant.
2. / e/ becomes /ɛ/ in a stressed consonant preceding fortis consonant.

$$e \rightarrow \varepsilon \text{ / } 'C _ C$$

$$\quad \quad \quad |$$

$$\quad \quad \quad [+fortis]$$

3. The first vowel of a vowel cluster becomes peripheral to the second follow in a stressed syllable preceding fortis consonant so that the vowel cluster is equal in length to a short vowel.

When / u/ is the first vowel of the vowel cluster in a stressed syllable, it is realized phonetically as labialization of the preceding consonant.

'gwala 'lizard'
'ɰweta 'tortilla cloth'

The two vowels of any other vowel clusters in stressed syllables preceding fortis consonant are articulated very quickly with the first vowel being peripheral to the second.

'dwela 'necessary'
'rwapi 'is climbing'

4. In unstressed syllables [e] fluctuates with [ɛ] preceding fortis consonant.

e'lezi ~ e'lezi 'corn hair'

5. When a consonant onset follows a branching rime containing a consonant, the consonant in the onset is lengthened somewhat. Across morpheme boundaries, /d/

becomes /t/ in this position.

iʒ'danda [iʒ't:antʌ] 'billowing'

biini 'child' + do 'diminutive' → bin'to 'little child'

Preceding a consonant cluster then, which has some "fortis tendencies," [e] fluctuates with [ɛ] as well in both stressed and unstressed syllables.

beʒ'ku'ni ~ beʒ'ku'ni 'soft tortilla'
ku'denzi ~ ku'dɛnzi 'bag'

[u] fluctuates with [w] in this same position:

'guendi ~ gʷendi 'imp'

6. Fortis consonants are not found in branching rimes containing consonants.

7. Fortis r is the only consonant not found preceding / a/ word-finally. It does not occur word medially, except in words of Spanish origin.

8. Fortis consonants rarely occur word-initially in unstressed syllables, except in words beginning with /ku/.

| | | |
|-------------|---------|---------------|
| Exceptions: | ka'luzu | 'frog' |
| | ʒe'sona | 'message' |
| | ʒa.gedi | 'possum' |
| | ku'dulu | 'ball' |
| | ku'liʒi | 'cabbage' |
| | ku'cina | 'foam' |
| | ku'čiu | 'tree trunk' |
| | ku'doni | 'shirt' |
| | ku'caca | 'grasshopper' |

9. Fortis consonants indicate two different grammatical classes:

1: stressed verb stem initial lenis consonant becomes fortis in causative verbs

ri'dena 'it is burning' ru'tena 'it causes burning'
ri'gatsi 'to hide' ru'katsi 'to cause to hide'

2. Verbs prefixed by 'coming' and 'going' prefixes indicate that it's the first time this is happening by the initial lenis consonant on the stem becoming fortis.

gua'ḡi 'to go and get for the first time
 gua'ḡi 'to go and get after the first time'

Since lenis consonants are shorter than fortis consonants, the phenomenon preceding lenis consonant can take their full time value.

1. In stressed syllables preceding lenis consonant vowels are long.
2. In a stressed syllable / e/ (never glottalized) following /ž/ and preceding lenis consonant (or word finally) is preceded by the semivowel /y/.

'žiezi 'town'
 'žieđa 'flour' but 'že'na 'plate'
 'ži'e 'feces'

This seems like the only rule that's different in that the first vowel of a cluster is peripheral to the second but only preceding LENIS consonants.

3. When a vowel cluster occurs in a stressed open syllable which is followed by a syllable beginning with a lenis consonant, both vowels receive equal length and together measure about two moras of length.

In a stressed syllable followed by a lenis consonant / u/ is not realized as labialization of the preceding velar consonant but retains its vocalic quality.

4. Falling and rising tone occur only in stressed syllables but not preceding fortis consonant.

Here is the list of the CVV words:

| | |
|----------------------------------|----------------|
| 'me ¹ e ¹ | 'swing' |
| 'na ¹ a ¹ | 'tilled soil' |
| 'ʒe ¹ a ¹ | 'resin' |
| 'bi ² ʒa ¹ | 'prickly pear' |
| 'be ² ʒo ¹ | 'moon' |
| 'be ² ʒe ¹ | 'nit' |
| 'du ² ʒu ² | 'string' |
| 'da ² ʒa ² | 'beans' |
| 'ʒo ² ʒo ² | 'river' |

Here is the list of words containing syllables with branching rimes containing a consonant:

monomorphemic words:

| | | | |
|-----------------------|----------------------|-------|---------|
| VC | | 'VC | |
| in ¹ da | 'type of fruit' | 'inda | 'water' |
| iʒ ¹ ku | 'three-legged stool' | 'iʒpa | 'both' |
| iʒ ¹ kiru | 'belly button' | | |
| iʒ ¹ kuadi | 'nest' | | |

| | | | |
|-----|------------------------|------|---------------------------|
| CVC | | 'CVC | |
| | 'lendiu | | 'type of plant' |
| | 'čanku | | 'turkey' |
| | 'činka | | 'rooster' |
| | 'dundu | | 'naked' |
| | 'čendu | | 'bare feet, head' |
| | ku ¹ densi | | 'bag' |
| | bi ¹ činči | | 'type of plant' |
| | iʒ ¹ kuntsi | | 'shell' |
| | iʒ ¹ danda | | 'swollen, billowing' |
| | iʒ ¹ pampa | | 'swollen, as a body part' |

polymorphemic words:

| | | | | | |
|----------------------|--------------------|--------|---------|--------|----------------|
| VC | | | | | |
| ar ¹ lo | 'in front of' | ar | ? | lo | 'face' |
| ir ¹ se | 'supper' | ir | ? | se | 'night' |
| ir ¹ sina | 'equipment' | ir | ? | sina | 'work' |
| in ¹ to | 'mole' <i>Spu.</i> | inda | 'water' | to | 'augmentative' |
| in ¹ daβa | 'sweat' | inda | 'water' | ʒilaβa | 'organs' |
| in ¹ la | 'nixtamal' | inda | 'water' | la | 'hot' |
| uʒ ¹ to | 'old man' | rudušu | 'growl' | to | 'augmentative' |

iʒ'teθu 'a plant' iʒ ? teθu 'squash plant'

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'VC

CVC

| | | | | | |
|------------|-------------|-------|-----------|-------|---------------|
| bin'to | 'child' | biini | 'child' | to | 'diminutive |
| biz'de | 'dust' | biizi | 'dry' | de | 'straw, ash |
| laz'to | 'liver' | lazi | 'liver' | to | 'augmentative |
| ʒetaz'dila | 'bread' | ʒeta | 'tortilla | ʒdila | |
| ʒuʒ'dila | 'wheat' | ʒua | 'corn' | ʒdila | |
| zeʒ'daba | 'large net' | zeʒa | 'net' | daba | 'horizontal |
| laʒ'da'ni | 'plant' | laga | 'leaf' | da'ni | |
| nuʒ'kaʔ | 'small' | nu | 'nom.' | čikaʔ | 'small' |

'CVC

'laʒka'la 'for this reason' la 'same raca 'to be' la ?

words of Spanish origin:

| | | |
|----------|-----------------|----------|
| biʒ'koda | acorn | billota |
| uʒ'dizi | authorities | justicia |
| al'deʒa | vat | artesa |
| gʷendi | imp | duendi |
| gʷelda | once in a while | juelta |